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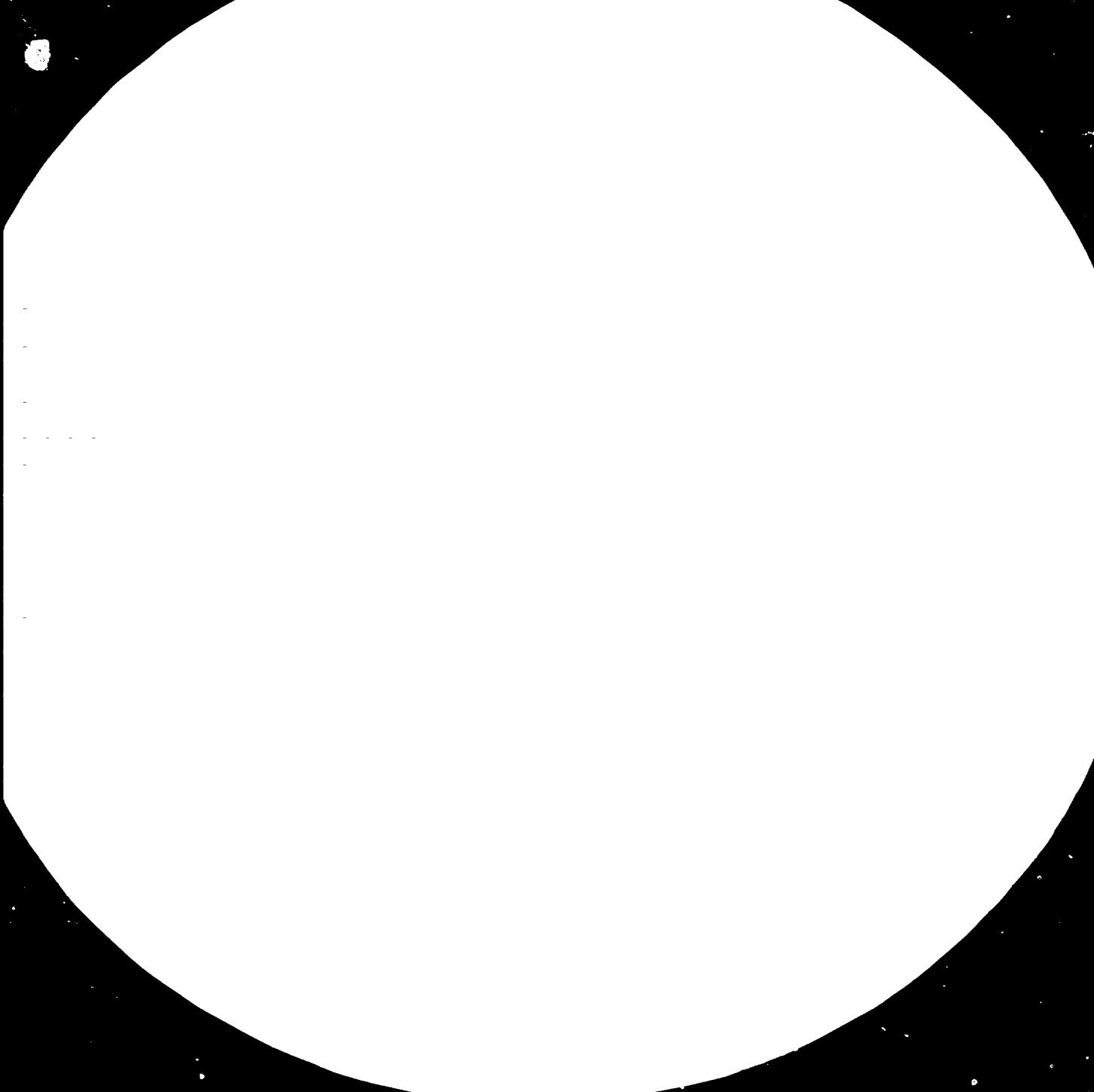
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DIRECTORY OF SOURCES OF SUPPLY OF 26 ESSENTIAL BULK DRUGS, THEIR
CHEMICAL INTERMEDIATES AND SOME RAW MATERIALS *

Prepared by

the UNIDO secretariat

003330

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PREFACE

1. The First Consultation on the Pharmaceutical Industry convened in Lisbon, Portugal in December 1980, recommended that UNIDO compile a directory of sources of essential bulk drugs from developed and developing countries.
2. This first version of the Directory covers the 26 Bulk Drugs jointly selected by UNIDO and WHO, from the WHO list of Essential Drugs for consideration at the First Consultation. In addition, the Directory identifies world-wide sources of supply for some major raw materials and intermediates required for the local production of these 26 selected Bulk Drugs, emphasis has been put on those with limited sources of supply.
3. Although some national and regional directories of chemical producers already exist, it is believed that this is the first attempt to compile a world-wide directory of suppliers of pharmaceutical products. It is hoped that the information provided will be valuable to purchasers who experience difficulties in identifying sources of supply.
4. The Round Table meeting held in Mohammadia, Morocco in December 1981, suggested that in addition to compiling this Directory, UNIDO should, whenever so requested by a developing country, use its best endeavours to provide information on indicative prices for drugs and intermediates. Thus, this publication can be seen as the first step in assisting developing countries to obtain their requirements of pharmaceuticals at the best possible prices and on most suitable delivery schedules.
5. The information contained in this Directory has been compiled by UNIDO from published sources and by writing to the International Federation of Pharmaceutical Manufacturers Association, national manufacturer associations and suppliers in various countries. Although care has been taken to ensure that the information is accurate, UNIDO cannot guarantee (a) that all sources of supply have been included; (b) that each producer is continuing production of the product in question; and (c) that the mailing and telex addresses given are the most recent ones.

6. For these reasons, UNIDO intends to treat this first version of the Directory as a draft, and to update the Directory from time to time. It will be given wide circulation so that additions and corrections may be suggested by both purchasers and suppliers who review its contents. Such corrections should be addressed to :

The Chief,
Pharmaceutical Industries Unit,
Chemical Industries Branch,
Division of Industrial Operations,
UNIDO,
P.O. Box 300,
A-1400 Vienna,
Austria.

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INTRODUCTION

The coverage of the Directory

1. The 26 essential drugs included in this Directory are as follows:

Acetylsalicylic acid	Insulin
Ampicillin	Isoniazid
Ascorbic acid	Mebendazole
Benzyl-penicillin	Paracetamol
Blood and Blood Fractions	Piperazine
Chloroquine phosphate	Primaquine
Cyanocobalamine	Propranolol
Eapsone	Reserpine
Diethylcarbamazine	Retinol
Erythromycin	Streptomycin
Ethambutol	Sulphadimidine
Ethinylestradiol + Norgestrel (Levo)	Tetracycline
Furosemide	
Hydralazine	

2. Some major raw materials and chemical intermediates required for the manufacture of these bulk drugs are included in this Directory and are listed in Table 1.

3. In Section I, a comprehensive list of sources of supply of each of the bulk drugs has been compiled. For each bulk drug the synonyms, reference to specifications, details regarding storage requirements are listed in addition to the names of manufacturers and suppliers. A distinction has been made between "a source of supply", which includes brokers and sales agents, i.e. "a supplier", and a manufacturer of the product, the former has been marked by an asterisks (*) in the Directory.

4. In Section II, a comprehensive list of sources of supply of the major raw materials and intermediates required for the manufacture of the 26 bulk drugs are provided. Emphasis has been placed on the more important intermediates, and those for which there are only a few suppliers. The more common Chemicals and solvents, which are readily available, and are widely used, have not been included.

5. In Sections I and II, only the name of the suppliers and the country of origin has been given. In Section III, the full address, telephone number and telex number of each supplier/manufacturer is provided as far as available at the time of completing this draft document.

SECTION I

BULK DRUGS

Manufacturers/Suppliers

and

Miscellaneous Details

26 ESSENTIAL BULK DRUGS

ACETYLSALICYLIC ACID
AMPICILLIN
ASCORBIC ACID
BENZYL-PENCILLIN
BLOOD AND BLOOD FRACTIONS
CHLOROQUINE PHOSPHATE
CYANOCOBALAMINE
DAPSONE
DIETHYLCARBAMIZINE
ERYTHROMYCIN
ETHAMBUTOL
ETHINYLESTRADIOL + NORGESTREL (LEVO)
FUROSEMIDE
HYDRALAZINE
INSULIN
ISONIAZID
MERENDAZOLE
PARACETAHOL
PIPERAZINE
PRIMAQUINE
PROPKANOLOL
RESERPINE
RETINOL
STREPTOMYCIN
SULPHADIMIDINE
TETRACYCLINE

SECTION I - BULK DRUG

Therapeutic Category: Analgesic and Antipyretic

Name of Product: Acetylsalicylic acid

Name of Manufacturers/
Suppliers:

- * Albright and Wilson, UK
- Alta Laboratories, Bombay, India
- Atabay, Istanbul, Turkey
- Bayer AG, F.R. Germany
- Chemapol, Checkoslovakia
- China National Chemicals, China
- Ciba Geigy, Basel, Switzerland
- Dow Chemicals, USA
- El Nasar, Egypt
- Farmitalia Farmaceutici, Milan, Italy
- Farmos Group, Finland
- Fine Chemicals Epping Industria, South Africa
- Grasser Salicylate, UK
- Hoechst, F.R., Germany
- Hyun Dai Thorm, S. Korea
- Industria Quimica Andia, Bogota, Columbia
- Lars Chistensen, Denmark
- Lepetit, Mexico City, Mexico
- Marcing and Co., Denmark
- Medexport, USSR
- Merck, F. R. Germany
- * Mitsui Pharmaceuticals, Tokyo, Japan
- * Mitsui Toatsu Chemicals, Japan
- Monsanto, UK
- Morton Norwich, USA
- * Nipper Kayaka, Tokyo, Japan
- Orion, Finland
- * Oxyde Joba, The Netherlands
- Oy Rohto, Finland
- Polfa, Poland
- Products Pyre, Spain
- Quim, Farm Platense, Buenos Aires, Argentina
- Rhone Poulenc, France

/Acetylsalicylic acid

- continued

Salicilato De Mexico, S. A. Mexico
Sanofi, France
* Sojuzchimexport, USSR
Spofa, Czechoslovakia
Sterling Drugs, USA
Sydney Ross, Rio De Janeiro, Brazil
Sudamfos S.A., Buenos Aires, Argentina
Union Fine Chemicals, S. Korea
Uzina Chimixport, Rumania

Aldenham

*Helm, F.R. Germany

*H and E Greef, U.K.

*Marsing, U.S.A.

Angelini Spa, Roma, Italy

ISF Spa, Milan Italy

/_____

* denotes supplier

Acetyl Salicylic acid:

Miscellaneous Details:

Synonyms:

Acetylsal Acid, Acesal, Acetosal,
Salicylic acid acetate, Acetyl-Salol,
Acidum Acetylsalicylicum, Polopiryna -O-
Acetoxybenzoic acid.

Specifications:

As per recognized official compendia.
International Pharmacopoeia, British
Pharmacopoeia, United States Pharmacopoeia,
British Pharmaceutical Codex, French Pharmacopoeia.

Description, Uses,
undesirable effects,
etc.

Reference Martindale 27th edition, pages 177-184
and relevant information as in official compendia.

Storage:

Store in airtight containers at temperature
not exceeding 30°C.

SECTION I - BULK DRUG

Category of Product: Antibiotics

Name of Product: Ampicillin

Name of Manufacturers/ Suppliers:

- Alembic, India
- Antiboticos, Spain
- Archifar, Italy
- Astra, USA
- Ayrest, USA
- Bago Laboratories, Argentina
- Bayer, F. R. Germany
- Beecham, USA and UK
- Benvenides Chimona de Mexico, Mexico
- Biochemie GmbH, Austria
- *Borge Pharmaceuticals, USA
- Bristol Meyer, USA
- Centro Industrial Bioquimicos, Mexico
- Ciba Geigy, Switzerland
- Cipan, Portugal
- Compañia Brasilia Antibioticas, Brazil
- Compañia Espanola Antibioticos, Spain
- Deva, Turkey
- Diamond Shamrock, USA
- Dong Wha Pharma, S. Korea
- Eurolatin Pharm, Mexico
- Fako, Turkey
- Farmitalia, Milan, Italy
- Fermentacones Sentisis, Mexico
- Fermic, Mexico
- Fermion Oy, Finland
- Flamma S.A.S., Italy
- Gist Brocade, The Netherlands
- Gruenthal GmbH, F.G. Germany
- Hindustan Antibiotics, India
- Hoechst, F. R. Germany
- *ICL, Roma, Italy
- IDPL, India
- Inkapharm Ltd., Isreal

/Ampicillin

- continued

Institut Biochemico Italiano, Milan, Italy
Lepiex, Argentina
• Medexports, Moscow, USSR
* Meiji-Seiko, Tokyo, Japan
Medimpex, Hungary
* Nikko Chemicals Co., Tokyo, Japan
Orion Pharmaceuticals, Finland
Orsase, Cuevnavaca Moreios, Mexico
Proter, Milan, Italy
Quimica Industrial Santo, Brazil
Quimica Lorenzini Sao Paulo, Brazil
Quinanas De Mexico, Mexico
Schering A.G. Berlin, F.R.Germany
Sin Tequini Industria Farma, Brazil.
Societe Bristol Meyer, France
Squibb, USA
* Takeda Chemicals, Japan
Wyeth, USA
Young Jin Pharma Ind., S. Korea

Addendum

Lab CT Srl, Sanromo, Italy
IBI, Milano, Italy
ISF, Milano, Italy
Pierrel Spa, Milan, Italy
Sigma Tau, Italy

/ _____

* denotes Supplier

Ampicillin:

Miscellaneous Details:

Synonyms: Ampicilllinum, Aminobenzylpenicillin

Specifications: As per recognised official compendia,
British Pharmacopoeia, U.S. Pharmacopoeia.

Description, Uses, Reference Martindale 27th edition pages 1071-1077
undesirable effects and other relevant information as in official compendia.
etc.

Storage: Store in airtight containers at a temperature
not exceeding 30°C. If intended for parental
administration the container should be sterile
and sealed to exclude microorganisms.

SECTION I - BULK DRUG

Therapeutic Category: Vitamins

Name of Product: Ascorbic acid

Name of Manufacturers/
Suppliers:

- * Agvar Chemicals, USA
- Alagoas Matevias Primas Maceio, Brazil
- * Alwit Ltd., UK
- Bayer AG, F.R. Germany
- * Byron Chemicals, USA
- Comptoir Chimique, France
- * Dolder Ltd., Switzerland
- * Fallek Chemicals, USA
- * Graymor Chemicals, USA
- * GYMA Laboratories, USA
- Hoechst AG, F.R. Germany
- Hoffman La Roche, Switzerland
- Jayant Vitamin, Bombay, India
- * K and K Greef, Co., UK
- * Marcing Ltd., USA
- * Medexport, USSR
- Merck, F.G. Germany
- Montoil S.A.R.L., France
- Orion Pharmaceutica, Finland
- Oy Rohto AG, Finland
- Pfizer International, USA
- Pfizer, Groton CT, Canada
- Pliva, Zagreb, Yugoslavia
- * Roland, Belgium
- Sarabhai Chemical, India
- Sanofi, France
- Strang Chemicals Co., UK
- * Syntetic, Denmark
- * Takeda Chem Industry, Hikari, Japan
- * Universal Perservachem Inc., USA
- Vitamin Inc., USA
- Yang Pharma, S. Korea
- Yu Yu Ind., S. Korea

Addendum:

Name of bulk drug: Ascorbic acid

Name of Manufacturer/ Supplier: Angelini, Roma, Italy
Lab CT, Italy

Ascorbic Acid:

Miscellaneous Details:

Synonyms:

Ascorb Acid, Acidum Ascorbicum, Vitamin C,
L Ascarbic acid, Cevitamin Acid, 3 OXO-L
Gulfuranolactone (enolic form), Hexuronil
acid.

Specifications:

As per recognized official compendia
International Pharmacopoeia, British Pharmacopoeia,
European Pharmacopoeia.

Description, Uses

Reference Martindale 27th edition pages 1566-1671

undesirable effects,
etc.

and other relevant information as in official
compendia.

Storage:

Store in airtight container free from contact
with metal. Protect from light.

SECTION 1 - BULK DRUG

Therapeutic Category: Antibiotic

Name of Product: Benzyl Penicillin (Sodium/Potassium)

Name of Manufacturer/
Suppliers:

- Aktibolagetkabi, Stockholm, Sweden
- Ankarfarm, Milan, Italy
- Antibioticos, Spain
- *Asahi Chemicals, Tokyo, Japan
- Bago Labs, Argentina
- Bayer A.G., F.R. Germany
- Biochemie Gmbli, Austria
- Boehringer Mannheim GmbH., F.R. Germany
- Bristol Meyer, USA
- Centrala Industriala Medic, Romania
- C.H.G. Blu, F.R. Germany
- China National Chemicals, China
- Ciba Geiga, Switzerland
- Cibiosa, Mexico
- Cipan, Portugal
- Compania Espanola de la Penicilin y Antibioticos, Spain
- Diamond Shamrock, USA
- Eurolatin Pharma, Mexico
- Farmitalia Farmaceuticii, Milan, Italy
- Fontoura, Brazil
- Gist Brocade, The Netherlands
- Glaxo, UK
- Gruenenthal GmbH, F.R. Germany
- Hindustan Antibiotics, India
- Leo Pharma, Denmark
- * Marcing and Co. Denmark
- Medexport, USSR
- Meiji Seika, Gifu, Japan
- Merck, USA
- Novo, Denmark
- Orion Pharmaceutica, Finland
- * Oxyde, Joba, The Netherlands
- Pfizer International Inc., USA
- Quimsa Industrial, Sao Paulo, Brazil

.../

/Benzyl Penicillin (Sodium/Potassium) - continued

Rhone Poulenç, France

Sarabhai, India

Squibb and Sons, USA

* Tokyo Tanaby, Japan

Wyeth, Philadelphia, USA

ISF Spa, Milano, Italy

Addendum

* denotes Supplier

Benzyl Penicillin:

Miscellaneous Details:

Synonyms:

Crystalline Penicillin G, Penicillin,
Penicillin G, Sodium or Potassium 2,3 dimethyl
7 OXO 6 phenyl acetamide-4-thial-azabicyclo
(3,2,0) heptane-2 carboxylate, Sodium or
Potassium phenylacetamidopenicillanate,
Benzyl Penicillium Notricum or Kalicum.

Specifications:

As per recognised official compendia,
International Pharmacopoeia, British
Pharmacopoeia, European Pharmacopoeia,
United States Pharmacopoeia.

Description, Uses,
undesirable effects,
etc.:

Reference Martindale 27th edition pages
1081 to 1089 and other relevant information
as in official compendia.

Storage:

Store in airtight container at temperature not
exceeding 30°C. If intended for parenteral
administration the container should be sterile
and sealed to exclude microorganisms.

SECTION I - BULK DRUG

Therapeutic Category: Immunological

Name of Product: Blood and Blood Fractions

Name of Manufacturers/
Suppliers:

Alpha Therapeutics, USA
Behringwerke Aktiengesellschaft, F.R. Germany
Biostest Serum Institut GmbH, F.R. Germany
Curewell Ltd., India
Duphar Interfram Ltd. India
Greencross Corp., S. Korea
Immuno A.G., Austria
Immuno GmbH. F.R. Germany
Institut Merieux, France
Kabi A.B., Sweden
Laboratories Landerlan, Spain
Laboratories Grifols, Spain
Laboratories Hubbev, Spain
*Marsing Div. Instel, USA
San Quisan mbH, Austria
Schweiz Serum, Bern, Switzerland
Sero, Wien, Austria
Tropenwerke Grbll, Koein 80, West Germany
Turkiye Kizilay, Ankara, Turkey
US Biochemicals Co., USA

Blood Preparations:

Synonyms:

Specifications: As per recognized official compendia,
International Pharmacopoeia, US Pharmacopoeia,
European Pharmacopoeia, British Pharmacopoeia.

Description, Uses Reference Martindale 27th edition, pages
Undesirable effects 257 to 270 and other relevant information in
etc.: official compendia.

Storage: Store in sterile containers sealed to exclude
microorganism at 4-6°C.

SECTION I - BULK DRUG

Therapeutic Category: Antimalarial

Name of Product: Chloroquine Phosphate

Name of Manufacturers/
Suppliers: Bayer AG, Leverkusen, Bayerwerk, W. Germany

BEC Chemicals, Bombay, India

Bengal Chemicals, Co. Calcutta, India

China National Chemicals, Peking, China

* Ciba Geigy, Basel, Switzerland

* Farmos, Turku, Finland

ICI, Millbank, London SWI, UK

* Marcing and Co., Denmark

* Medexport, Moscow, USSR

* Medimpex, Budapest, Hungary

* Orion Pharmaceutica, Helsinki, Finland

* Oxyde-Joba, Netherlands

Rhone Poulenc, Paris, France

Sanofi, Paris, France

Sterling Drug Inc., New York, USA

Suneeta Labs Indore, India

Addendum: Angelini, Roma, Italy

/

* denotes Supplier

Chloroquin Phosphate:

Miscellaneous Details:

Synonyms:

Chloroquin Phosphate

Specifications:

As per recognized official compendia,
British Pharmacopoeia, United States
Pharmacopoeia.

Description, Uses,
undesirable effects,
etc.

Reference Martindale 27th edition, pages
344-346 and other relevant information as
in official compendia.

Storage:

Store in well closed container at temperature
not exceeding 30°C. Protect from light.

SECTION I - BULK DRUG

Category of Product: Vitamin

Name of Product: Cobalamine (hydrox/cyano)

Name of Manufacturers/
Suppliers:

Armour Pharmaceuticals, USA

Bago Labs, Argentina

Chemical Dynamics, USA

* Falle K. Chemicals, USA

Farmitalia (Montedison) Milan, Italy

Glaxo Holdings, UK

* Greef, R.W. Co. Ltd., USA

Harmonas Vitamins, Mexico

Hoffman La Roche, F.R. Germany

Instituto delle Vitamin, Italy

Kemika Industrial, Mexico

Laboratories Delgrange, France

Lilly Eli, USA

Medimpex, Hungary

Merck, E. F.R. Germany

Merck, Rahway, USA

Merck, Sharp Dhome, USA

Mexoper, Mexico

Orion Pharmaceutica, Finland

Pfizer Inc., USA

Phillips Dupher, F.R. Germany

Pierrel Spa, Italy

Products Quimicos, Mexico

Quimo, Product Quimico, Brazil

Rhone Poulenc, France

Roussel Uclaf, France

Sanofi, France

Sintequini S.A. Industria Farm, Pelota, Brazil

Strang Chemical Co., UK

Themis Chemicals, India

Unipex, France

Vitamin Inc., USA

Addendum

Name of Bulk Drug: Cyanocobalamine

Name of Manufacturer/ Angelini Spa, Italy

Supplier: Farmitalia Carlo Erba, Italy

Cyanocobalamin, Vitamin B12

Miscellaneous Details

Synonyms: Cyanocobal, Cyanocobal aminum, Cobamin,
Cycobemin, Vitamin M12, L 5, 6
Dimethylbenzimidazol-1-yl-cyanocobamide.

Specifications: As per recognised official compendia,
International Pharmacopoeia, British
Pharmacopoeia, European Pharmacopoeia,
United States Pharmacopoeia.

Description, Uses Reference Martindale 27th edition pages
undesirable effects 1679-1681 and other relevant information as
etc. in official compendia.

Storage: Store in airtight container. Protect from
light.

SECTION I - BULK DRUG

Therapeutic Category: Antileprotic

Name of Product: Dapsone

Name of Manufacturers/
Supplier: Ayevst, New York, USA
Bengal Chemicals, Calcutta, India
China National Chemicals, Peking, China
Hoechst A.G., Frankfurt, F.R. Germany
* K and K Greef Chemicals, UK
* Medexport, Moskow, USSR
* Mercing and Co., Denmark
* Oxyde - Joba, The Netherlands
Rhone-Poulenc, Paris, France
Roussel Uclaf, Paris, France
* RSA Corporation, Ardsley, USA
Sree Krishna Pharma, Hyderabad, India
Theodor Schuchard, F.R. Germany

/-----

* denotes Supplier

Dapsone:

Miscellaneous Details:

Synonyms: Dadps, Dapsonu, Diaphenylsulfone, DDS,
Disulone.

Specifications: As per recognized official compendia
International Pharmacopoeia, British
Pharmacopoeia, United States Pharmacopoeia.

Description, Uses, Reference Martindale 27th Edition, pages
undesirable effects, 1499-1503 and other relevant information
etc.: as in official compendia.

Storage: Store in well-closed light-resistant container
at temperature not exceeding 30°C.

SECTION I - BULK DRUG

Therapeutic Category: Antifilarial

Name of Product: Diethylcarbamazine

Name of Manufacturers/
Suppliers:

Aceto Chemicals, USA
American Cyanamid, USA
* B.H. Schilling, Italy
Burroughs Wellcome, India
* Helm New York Chemicals, USA
Hoechst AG, F.R. Germany
IDPL, India
* Marcing and Co. Denmark
* Maypro Industries, USA
Rexolin Chemicals AB, Sweden
Rhone Poulenc, France
Roussel Uclaf, France
* R. W. Greef Co., USA
* S.S.T. Corporation, USA
Wanderchemie AG, Switzerland
Wardblenkinsop, UK
Unipex, France

/ _____
* denotes Supplier

Diethylcarbamazine:

Miscellaneous Details:

Synonyms: (Diethylcarbene Cit, Diethyl Carbamazini Citras, Ditrazini Citras, Diethylcarbazine Acid Citrate, 1 Diethylcarbamoyl-4-methylpiperazine dihydrogen citrate).

Specifications: As per recognised official compendia, International Pharmacopoeia, United States Pharmacopoeia.

Descriptions, Uses,
Undesirable effects.
etc. Reference Materials 27th edition pages 101-102 and other relevant information in official compendia.

Storage: Store in air tight containers at a temperature not exceeding 30°C.

SECTION I - BULK DRUG

Category of Product: Antibiotics

Name of Products: Erythromycin

Name of Manufacturers/
Suppliers:

- Abbot, USA
- Achifar, Italy
- Alembic, Broda, India
- Ankerfarm, Milan, Italy
- Antiboticos, S.A., Italy
- *Borge International, USA
- CEPA, Arenjulz, Spain
- Chemikalien AG, F.R. Germany
- Ciba Geigy, Switzerland
- Cipan, Portugal
- Companian Brasileirade Antibiotics, Brazil
- Diamond Shamrock, USA
- Dista Products, Liverpool, UK
- *Dolder Ltd., Switzerland
- Eli Lilly, USA
- Farmos Group, Finland
- Fermic, Inapalpa, Mexico
- *Flavine International, USA
- *GYMA Labs, USA
- *K and K Greef Chemical, UK
- *Marcing and Co. Denmark
- Orion Pharmaceutica, Finland
- Pfizer, USA
- Pierrel, Milan, Italy
- Priti Chemical Industries, India
- Proter, Milan, Italy
- Roussel Uclaf, France
- Upjohn, USA

* denotes Supplier

Eryti romycin

Miscellaneous Details

Synonyms: Erythromycinum

Specifications: As per recognized official compendia,
International Pharmacopoeia, British Pharmacopoeia
European Pharmacopoeia, United States Pharmacopoeia.

Description Uses, Reference Martindale 27th edition pages

undesirable effects 1130-1134 and other relevant information as
etc.: in official compendia.

Storage: Store in airtight container at temperature not
exceeding 30°C. Protect from sunlight.

SECTION I - BULK DRUG

Therapeutic Category: Antituberculosis, Tuberculostatic

Name of Product: Ethambutol

Name of Manufacturers/
Suppliers:

Abbot Universal Ltd., Chicago USA
American Cyanamid Co., New Jersey, USA
Chong Kun Dang, S. Korea
Farmaceutica Milanese, Milan, Italy
Handock Remedia, S. Korea
Huhtamaki OY, Turku, Finland
Instituto Chemitrepico, Milan, Italy
Italsintex, S.R.L., Padova, Italy
*Lupin Laboratories, India
Medexport, Moscow, USSR
Medimpex, Budapest, Hungary
Orion Pharmaceutica, Helsinki, Finland
*Oxyde - Joba - The Netherlands
Pierrel, Milan, Italy
Priti Chemicals, Bombay, India
*Rapto Kos Brett, Worli, India
Sobio Laboratories, Paris, France
Themis Pharmaceuticals, Bombay, India

Addendum

Vecchi and Piam, Genova, Italy

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* denotes Supplier

Ethambutol:

Miscellaneous Details:

Synonyms: Ethambutol Hydrochloride, 2:2 ethylene
diminodi 1 butanol

Specifications: As per recognized official compendia,
British Pharmacopoeia, United States
Pharmacopoeia.

Description, uses, Reference Martindale 27th edition,
undersirable effects, pages 1586-1587 and the relevant
etc. information as in official compendia.

Storage: Preserve in well closed container at
temperature not exceeding 30°C.

SECTION I - BULK DRUG

Category of Product: Oral Contraceptive

Name of Product: Ethinylestradiol + Norgestrel (Levo)

Name of Manufacturers/
Suppliers:

- *Alwitt Ltd., UK
- *Agvar Chemicals, USA
- *Dolder, Switzerland
- *GYMA Laboratories, USA
- Orion Pharmaceutica, Finland
- Organon Inc. USA
- Roussel Uclaf, France
- Schering AG, F.R. Germany
- Searle Chemical, USA
- Syntex, Mexico
- Wyeth, USA

Addendum: *MedimpeX, Hungary

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* denotes Supplier

Ethinylestradiol

Miscellaneous Details:

Synonyms: Ethinydoestr., Aethinyloestradiolum,
Ethyinyl Estradiol, Ethinylestradiolum,
Etinilestradiol

Specifications: As per recognized official compendia, British
Pharmacopoeia, European Pharmacopoeia, U.S. Phar-
macopoeia.

Description, Uses Reference Martindale 27th edition pages 1396 to
undesirable effects, 1398 and other information as in official compendia.
etc.:

Storage: Store in cool place, air tight container.
Protect from sunlight.

Norgestrel (levo)

Miscellaneous Details

Synonyms: Levonorgestrel, Denorgestrel

Specifications: As per recognized official compendia.

Description, Uses
undesirable effects
etc: Reference Martindale pages 1413-1414 and other relevant information as in official compendia.

Storage: Store in cool place air tight container.
Protect from light.

SECTION I - BULK DRUG

Therapeutic Category: Diuretic

Name of Product: Furosemide

Name of Manufacturers/
Suppliers:

Ache Laboratories S.A., Sao Paulo, Brazil
China National Chemicals, China
Fabbrica Italiana, Sintetics, Italy
Farmos Group, Finland
Han Dok, Remedia, Seoul, S. Korea
Hoechst AG. W. Germany
IDPi, India
*K and K Creel Chemicals, UK
Labetica, South Africa
Laboratories Mag, Milan, Italy
Laboratorios Almirall, Cardoner, Spain
*Marcing and Co. Denmark
Medimpex, Hungary
Orion Pharmaceuticals, Finland
Polfa, Poland
Scharper Care EMA, USA

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* denotes Supplier

Furosemide:

Miscellaneous Details:

Synonyms:

Furosemide, Frusemide, Furosemide, 4 chloro-2
furfuryl amino 5, sulphamoylbenzoic acid,
4 chloro-N-furyl-5-sulphamoylantranilic acid

Specifications:

As per recognized official compendia,
International Pharmacopoeia, British Pharmacopoeia
and United States Pharmacopoeia.

Description, Uses

Reference Martindale 27th edition pages 554 to

Undesirable effects

560 and other relevant information as in

etc.:

official compendia.

Storage:

Store in airtight container. Protect from light.

SECTION I - BULK DRUG

Category of Product: Antihypertensive

Name of Product: Hydralazine Hydrochloride

Name of Manufacturer/
Suppliers:

- *Alba Chemicals , USA
- *American Roland Corp., USA
- Bayer AG, F.R. Germany
- Beutex Chemicals, USA
- Chemical Dynamics, USA
- Ciba Geigy, Switzerland and USA
- *Davos Chemicals, USA
- Eisen Pharma, India
- *Flavine International, SUA
- *GYMA Laboratories, USA
- *Maypro Industries, USA
- *MWM Chemicals, USA
- *Napp Chemicals, USA
- Rhone Poulenc, France
- *Sumitomo Chemicals, Japan
- *Toyama Chemicals, Japan
- Toyo Hydrazine Industry,Japan

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* denotes Supplier

Hydralazine Hydrochloride

Miscellaneous Details

Synonyms: Hydralazine Hydrochloride, Apressinum,
Hydralazini Hydrochloridum Hydrazinophthalazine
Hydrochloride

Specifications: As per recognized official compendia,
International Pharmacopoeia, British Pharmacopoeia,
United States Pharmacopoeia.

Description Uses, Reference Martindale 27th edition pages 664 to
undesirable effect, 665 and other relevant information as in official
etc. compendia.

Storage: Store in airtight containers at temperature not
exceeding 30°C.

SECTION I - BULK DRUG

Therapeutic Category: Antidiabetic

Name of Product: Insulin

Name of Manufacturers/
Suppliers:

Alembic Chemicals, India
Armour Pharmaceuticals, USA
Biofar Insumos, Monte Carlos, Brazil
Boots Co., UK
Chemapol, Czechoslovakia
China National Chemicals Corporation, China
Choay Laboratories, France
Christian Brunnengraeber, Chemische Fabrik,
F.R. Germany
Connaught, Toronto, Canada
Diosynth, The Netherlands
Eli Lilly and Co., USA
Hoechst Spa, Italy .
Leo Laboratories, UK
* Marcing and Co. Denmark
Muenchen Gmbh, F.R. Germany
Nordisk, Denmark
Novo Industries, Denmark
Opos SRI, Italy
Organon, N.V., The Netherlands
Pfanstiehl Laboratories, USA
Pharmachin, Sofia, Bulgaria
Philips Duphar, The Netherlands
* Strang Chemicals, U.K.
* Weddel Pharmaceuticals, Clwyd, UK
Wellcome, UK

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* denotes Supplier

Insulin

Miscellaneous Details

Synonyms: Insulin injection, Insulini Injecto,
Insulini solatio Injectabilis, Insulin,
Insulin hydrochloride, Ordinary Insulin,
Regular Insulin, Soluble Insulin, Unmodified
Insulin.

Specifications: As per recognized official compendia,
International Pharmacopoeia, European
Pharmacopoeia, British Pharmacopoeia.

Description, Uses Reference Martindale 27th edition pages
undesirable effects 799 to 804 and other relevant information
etc.: as in official compendia.

Storage: Store at 2-10⁰C. Should not be allowed to freeze.

SECTION I - BULK DRUG

Category of Product: Antituberculosis

Name of Product: Isoniazid

Name of Manufacturers:

- *Alwitt Ltd., UK
- *American Roland, USA
- Asia Pharmaceuticals, S. Korea
- Bayer AG. F.R. Germany
- Bofors AB, Sweden
- Chemical and Pharmaceutical Laboratories, India
- China National Chemicals, China
- *Dolder Ltd., Switzerland
- *FBA Pharmaceuticals, USA
- Cerardo Ramon, Nuenos Aires, Argentina
- *GYMA Laboratories, USA
- *Helm New York Chemicals, USA
- Hoffman La Roche, Switzerland
- *Iwaki and Co. Japan
- Lepetite, Euenos Aires, Argentina
- *Marcing and Co. Denmark
- *Marsing, Div Intsel, USA
- Orion Pharmaceutica, Finland
- Park Davis, USA
- Pfizer International, USA
- Reilly Tar, and Chemicals, USA
- Rhone Poulenc, France
- S.S. T. Corporation, USA
- Sunecta Labs, India
- *Takeda Chemicals, Japan
- Yu Yu Industrial, S. Korea

Addendum: Vecchi and Piam, Genova, Italy

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* denotes Supplier

Isonizid:

Miscellaneous Details:

Synonyms:

Isoniaz, Isoniazidium, Isonicotinic acid,
Hydrazide, Isonicotinylhydrazide,
Isonicotinylhydazine, Tubazid
Isonicotinoylhydazine, Pyridine-4-carbohydrazide.

Specifications:

As per recognised official compendia, International
Pharmacopoeia, British Pharmacopoeia, United
States Pharmacopoeia.

Description, Uses
undesirable effects,
etc.:

Reference Martindale 27th edition pages 1589-
1593 and other relevant information in official
compendia.

Storage:

Store in airtight containers. Protect from light.

SECTION I - BULK DRUG

Therapeutic Category: Antihelmintic

Name of Product: Mebendazole

Name of Manufacturers/ ACIC Ltd., Toronto, Canada
Suppliers: Bayer, W. Germany

Chemapol, Czechoslovakia

China National Chemical, China

*Fairdeal Corporation, Bombay, India

FDC, Bombay, India

ICPI (Industrie Chimiche Farmaceutica Italia)
Italy

Janssen Pharmaceuticals, Belgium

*K and K Greef, UK

*Marsing, Denmark

Matthews and Wilson, UK

Priti Chemicals, India

Shin Pong Pharmaceuticals, S. Korea

Addendum: Instituto Franco Tosi, Milan, Italy

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* denotes Supplier

Mebendazole

Miscellaneous Details:

Synonyms: Methyl (5 benzol benzimidazol - 2 yl carbamate)

Specification: As per recognised official compendia, British Pharmacopoeia, United States Pharmacopoeia.

Description, Uses,
Undesirable effects,
etc. Reference Martindale 27th edition pages 106, and other relevant information in official compendia.

Storage: Store in air-tight container at temperature not exceeding 30°.

SECTION I - BULK DRUG

Therapeutic Category: Analgesic

Name of Product: Paracetamol

Name of Manufacturers/
Suppliers:

- Amphiry Labs, Bombay, India
- Asia Pharmaceuticals, Seoul, S. Korea
- Atabay, Istanbul, Turkey
- Bayer AG, Leverkusen Bayerwerk, Germany
- China National Corporation, Peking, China
- Ciba Geigy, Basel, Switzerland
- Diamond Shamrock, USA
- Duphar Interfran, Bombay, India
- Framos Group, Turku, Finland
- Fawdon, Newcastle on Tyne, UK
- Graesser Salicylate, Clwyd, UK
- Hoechst AG, Frankfurt, W. Germany
- IDPL, India
- Indian Drugs and Pharm., Gurgaon, India
- Indian Process Chemicals, Bangalore, India
- *Iwaki, Japan
- *K and K Creef, UK
- *Kawashi, Kawashi, Japan
- Mallinc Krotz, Raleigh, USA
- *Marsing and Co., Denmark
- Monsanto, St. Louis, USA
- Orion Pharma., Helsinki, Finland
- *Oxyde, Joba, The Netherlands
- Oy Rhoto, Tammisaari, Finland
- Penick S.B., Lyndhurst, New Jersey, USA
- Quimica Siul, Victoria, Argentina
- Rhone Poulenc, Paris, France
- Sampoong, Seoul, S. Korea
- Sanofi, Paris, France
- Sevenstar, Taiwan
- Sigma S.A., Mexico
- Sterling Drug, New York, USA

/Paracetamol

Sociedad Mexicana De Industrial, Mexico

Sree Krishna Pharmaceuticals, India

Sterling Organic, Dudley, UK

Union Fine Chemicals, Seoul, S. Korea

Addendum:

Angelini Spa, Roma, Italy

Paracetamol

Miscellaneous Details

Synonyms: Acetamenophen, 4 Acetamido phenol,
4 Hydroxyacetanilide, N Acetyl p aminophenol,
N-P-Hydroxyphenylacetamide.

Specifications: As per recognized official compendia,
British Pharmacopoeia, United States Pharmacopoeia.

Description, Uses, Reference Martindale 27th edition, pages
undesirable effects, 201-204 and other relevant compendia.

Storage: Store in well closed container at a temperature
not exceeding 30⁰C. Protect from light.

SECTION I - BULK DRUG

Category of Product: Antihelmintic

Name of Product: Piperazine

Names of Manufacturers/
Suppliers:

Aceto Chemicals, USA
AC Industries, USA
Acna, Cengio, (Savona), Italy

BASF, F. R. Germany
Bayer, F. R. Germany
Boehringer Ingelheim GmbH, F.R. Germany
Chemische Fabrik Schweizerhall, Switzerland
Delamine B.V. Delfzijl, The Netherlands
Dolder Ltd., Switzerland
Dow Chemicals, USA
Flavine International, USA
Ciusto Farvelly, Italy
Givandan, France
IDPL, India
Japan Hydrazine Co., Japan
Joba B.V., The Netherlands
K and K Greef, UK
Marcing and Co. Denmark
Mars Chemicals, USA
Rexolin Chemicals, Sweden
Rhone Poulenc, France
Ringer Chemicals and Co., USA
Schilling BH, Italy
Sietetsa Kagawa, Japan
Sumitomo Chemicals, Oska, Japan
Texaco Chemicals, USA
Union Carbide, USA
Ward Belknap, UK

Addendum: Stip Lab Chimico Biologico, Italy

Piperazine:

Synonyms:

Piperazine (available as Piperazine Citrate, Piperazine Hydrate, Piperazine Phosphate).

Specifications:

For Piperazine Citrate as per British Pharmacopoeia. For Piperazine Hydrate (as per FPC). For Piperazine Phosphate as per British and United States Pharmacopoeias.

Description, Uses
undesirable effects.
etc.

Reference Martindale 27th edition pages 108-110, and other relevant information in official compendia.

Storage:

Store in airtight container. Protect from light.

SECTION I - BULK DRUG

Therapeutic Category: Antimalarial

Name of Product: Primaquine

Name of Manufacturers/
Suppliers: Alba Chemicals, USA
Bayer AG, F.R. Germany
*Conary Chemicals, USA
*Joba, The Netherlands
*Marsing and Co. Denmark
Sterling Drug, USA

Addendum: I.C.I., U.K.

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* denotes Supplier

Primaquine

Miscellaneous Details

Synonyms:

Primaquine Phosphate, Primaquini Diphosphas,
Primachin Phosphate, Primaquinium Phosphate.

Specifications:

As per recognized official compendia,
International Pharmacopoeia, British
Pharmacopoeia, United States Pharmacopoeia.

Description, Uses

Reference Martindale 27th edition page 353

undesirable effects

and other relevant information as in official
compendia.

etc.:

Storage:

Store in airtight container. Protect from light.

SECTION 1 - BULK DRUG

Therapeutic Category: **Cardiovascular - Antihypertensive**

Name of Product: **Propranolol**

Name of Manufacturers/
Suppliers:

*Ayrest Labs., New York, USA
Centrala Industriala Medio, Romania
Farmos Group, Turku, Finland
I.C.I. London, UK
I.C.F.I. Spa., Italy

Addendum: **Instituto Franco Tosi, Milan, Italy**

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* denotes Supplier

Propranolol:

Miscellaneous Details:

Synonyms: Propranolol,
Hydrochloride, Anaprilin, Proprasylyte.

Specifications: As per recognized official compendia,
British Pharmacopoeia, United States
Pharmacopoeia.

Description, Uses, Reference Martindale 27th edition
Undesirable effects, pages 1312-1319 and other relevant information
etc.: as in official compendia.

Storage: Protect from light. Store at temperature
not exceeding 30°C.

SECTION I - BULK DRUG

Category of Product: Antihypertensive

Name of Product: Reserpine

Name of Manufacturers/
Suppliers:

Boehinger Ingelheim, F.R. Germany
Boehinger Mannheim GmbH, F.R. Germany
*Centerchem. Internationa, USA
*Flavine International, USA
Invernidelbaffa Vera, Via Rimpemont, Milan, Italy
*Marcing and Co. Denmark
*Maypro Industries, USA
*SST Corporation, USA

Abiendum: Ciba Geigy, Switzerland

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* denotes Supplier

Reserpine

Miscellaneous Details

Synonyms: Reserpinum

Specifications: As per recognized official compendia,
International Pharmacopoeia,
European Pharmacopoeia, British Pharmacopoeia.

Description, Uses Reference Martindale 27th edition pages 674-677
undesirable effects and other official compendia

etc.:

Storage: Store in airtight container protected from light

SECTION I - BULK DRUG

Category of Product: Vitamin

Name of Product: Retinol

Name of Manufacturers:

- Alembic Products, UK
- Basf Wyandotte, USA
- Caveteco, Argentina
- Chemical Dynamic, USA
- Chemicals and Feeds, UK
- *Fallek Chemicals, USA
- Hoffmann La Roche and Co. Switzerland
- ICC Industries, USA
- Lannacher lieilmittel, Austria
- Merck E, F.R. Germany
- Pfizer Inc., USA
- Pharm Chem Labs., USA
- Productos Roch-Quimcoso, Brazil
- Rhone Poulenc, USA
- Riken Vitamin Oil Ltd., Japan
- Roche Products, UK
- Vitamins Inc., USA
- Wander GmbH., Austria

Addendum: Lab CT, Italy

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* denotes Supplier

Retinol:

Miscellaneous Details:

Synonyms:

Vitaminum A, Retinol, Anti infective Vitamin,
Antixerophthalmic Vitamin, Azerophthol,
Axerophthylam.

Specifications:

As per recognised official compendia,
British Pharmacopoeia, United States
Pharmacopoeia.

Description, Uses,
Undesirable effect
etc.

Reference Martindale 27th edition pages
1701-1704 and other relevant information
as in official compendia.

Storage:

Store in cool, well filled airtight container under an atmosphere of inert gas. Protect from light.

SECTION I - BULK DRUG

Therapeutic Category: Antibiotics

Name of Product: Streptomycin Sulphate

Name of Manufacturers/
Suppliers:

Alba Chemicals, USA
Centrala Industria La Medic, Romania
China National Corp., China
Ciba Geigy, Switzerland
*Flavine International, USA
Glaxo Holdings, UK
*GYMA Labs, USA
*Helm New York Chemicals, USA
Hoechst AG, F.R. Germany
Hindustan Antibiotics, Poona, India
*Marcing and Co. Denmark
Orion Pharmaceutica, Finland
*Oxyde Joba, The Netherlands
Pfizer International, USA
Rhone Poulenc, France
Symbiotic, India

Addendum: Medexport, USSR

ISF Spa, Italy

Streptomycin Sulphate:

Miscellaneous Details

<u>Synonyms:</u>	Streptomycini sulfas
<u>Specifications:</u>	As per recognized official compendia, International Pharmacopoeia, U.S. Pharmacopoeia, British Pharmacopoeia, European Pharmacopoeia.
<u>Description, Uses undesirable effects etc.:</u>	Reference Martindale 27th edition pages 1181-1185 and other relevant information in official compendia.
<u>Storage:</u>	Store in airtight containers at a temperature not exceeding 30°C. If intended for parenteral administration the container should be sterile and sealed to exclude microorganisms.

SECTION I - BULK DRUG

Therapeutic Category: Antibacterial

Name of Product: Sulphadimidine

Name of Manufacturers/Suppliers:

- Acetochemical, USA
- ACF Chemifarma, The Netherlands
- American Cyanamide, USA
- Benaco, Italy
- Bristol Meyer, USA
- Chemapol, Czechoslovakia
- China National Chemical, China
- Cosima, Belgium
- * Dolder, Switzerland
- El Nasr, Egypt
- Exico, UK
- * Fallek Products, The Netherlands
- Farmitalia, Milan, Italy
- Giusto Faravelli, Italy
- ICI, UK
- IDPL, India
- Instituto Chemioterapico, Italy

- Laboratoris Julian, Mexico
- * Marcing and Co., Denmark
- May and Barker, UK
- * Medimpex, Hungary
- * Napp Chemicals, USA
- * Oxyde - Joba - The Netherlands
- Pharmacim, Bulgaria
- Pierrel, Italy
- Pliva, Zagreb, Yugoslavia
- Polfa, Poland
- Productora G. De Perfumaria, Spain
- Rachelle Labs, USA
- Sinbiotik, Mexico
- Strang Chemicals, UK
- Syntetic, Denmark
- Unwin, R. W. UK

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* denotes supplier

Sulphadimidine:

Miscellaneous Details:

Synonyms: Sulphadimidini Sodium, Sulphadimid Sodium
Sulfadimidine Sodium, Soluble Sulphadimidine,
Soluble Sulphadimethylpyrimidine Soluble
Sulphamethazine.

Specifications: As per recognized official compendia.
British Pharmacopoeia, United States
Pharmacopoeia.

Description, Uses Reference Martindale 27th edition pages
undesirable effects, 1430-1481, and other relevant information
etc.: as in official compendia.

Storage: Store in airtight containers Protect from light.

SECTION I - BULK DRUG

Therapeutic Category: Antibiotics

Name of Product: Tetracycline

Name of Manufacturers/
Suppliers:

- Alba Chemicals, USA
- Archifar, Milan, Italy
- American Cyanamid Co., USA
- American Roland, Corp, USA
- Ansa, Turkey
- Antitioticos S.A. Spain
- Astra, Sweden
- Banyu Pharma, Japan
- Bentex Chemicals, USA
- Bristol Meyers, USA
- Carlo Erba, Milan, Italy
- China National Chemical, Peking, China
- Chong Kong Dong, S. Korea
- Ciba Geigy, Switzerland
- Cipan, Portugal
- Cosima PVBA, Belgium
- Dong Wha Pharma, South Korea
- *Fallek Products, The Netherlands
- Farmitalia, Milan, Italy
- Fermic S.A., Mexico
- *GYMA Labs, USA
- *Helm New York Corporation, USA
- Hindustan ANtibiotics, India
- Hoechst, F.R. Germany
- ICL, Italy
- ICN-Arco, Switzerland
- *Iwakis, Japan
- *K and K Greef, UK
- Krka Pharm, Yougoslavia
- Lepetit, Italy
- *Marcing Div. Intsel, USA
- *Marsing and Co. Denmark
- Meiji Seika Kaisha, Japan
- Novo Industries, Denmark
- Orion Pharmaceutica, Finland
- *Oxyde Joba, The Netherlands

Pfizer, USA
Pharmuka, France
Pierrel Spa, Italy
Pliva Pharmaceuticals, Zagreb, Yougoslavia
Polfa, Poland
Proter, Milan, Italy
Quimasa, Sao Paulo, Brazil
Rachell Laboratories, Long Beach, California, USA
Roussel, Uelaf, France
Societe Bristol Meyer, France
Société Chemique Pointed Girad, France
Squibb, Princeton, USA
Sterling, USA
Strang Chemicals, UK
Takeda Chemicals, Oska, Japan
Upjohn Company, USA

Addendum:

Pharmachen, Bulgaria
Angelini, Roma, Italy
IBI, Italy

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* denotes Supplier

Tetracycline

Miscellaneous Details

Synonyms: Tetracycline Hydrochloride, Tetracyclinihydrochloridum

Specifications: As per recognized official compendia, International Pharmacopoeia, British Pharmacopoeia, European Pharmacopoeia, United States Pharmacopoeia.

Description, Uses
undesirable effects,
etc. Reference Martindale 27th edition pages 1186 to 1193 and other relevant information as in official compendia.

Storage: Store in airtight container. If intended for injection the container should be sterile and sealed to exclude microorganisms. Protect from light.

SECTION II

RAW MATERIALS/CHEMICAL INTERMEDIATES

MANUFACTURERS/SUPPLIERS

LIST OF RAW MATERIALS/CHEMICAL INTERMEDIATES - TABLE 1

Acetic Anhydride
Acetyl Acetone
Acetanilide
Alphanophol
6 Amino Penicillanic acid
Para Aminophenol
D-2-Aminobutanol
P-Anisidine
M Chloroaniline
Chloroanthranilic Acid
P Chloronitrobenzene
Chlorosulphonc Acid
3:4 Diaminobenza-phenone
4:4 Dichlorodiphenylsulfone
4:6 Dichlor-3-Sulfamoylbenzoic Acid
4:7 Dichloroquinoline
N:N Dimethylaniline
Diethylcarbamylchloride
Diphenyloxide
Epichlorohydrin
Ethylene Dichloride
Erythromycin Thiocynate
Estrone/Estradiol and Salts/Esters
Ethylene Diamine Hydrochloride
Gamma Picoline
Guaridine Nitrate
Hydrazine Hydrate
Isonicotinic Acid
Isopropylamine
1 Methylpiperazine
Mono Ethanolamine
1:4 Nitrobenzene
Noval diamine (5 Diethylamino 2 - amino pentane)
D Phenylglycine
Salicylic acid
Sorbitol
Sulphaguanidine
Sulphurychloride
Tetracycline Arquad Salt

Raw Materials/Chemical Intermediates

Name of Product: Acetylsalicylic acid

Name of Raw Material/
Chemical Intermediate: Acetic Anhydride

Name of Manufacturer/
Supplier:

Amcel Europe S.A. Chemical Group, Belgium
Arnaud Chemicals, France
Ashland Chemicals, USA
BDH Chemicals, UK
Celanese Chemicals, USA
Charles Tennant, UK
Chemproha Chemische, The Netherlands
Comptoir Chimique, France
C Van Epenhuysen Chemische, The Netherlands
Distilleri Italane, Italy
Eastman Chemicals, USA
Eastman Chemicals International, UK
Erba Carlo Spa, Italy
Heim and Lundin, Norway
Hoechst AG, F. R. Germany
Hopkin William, UK
J.T. Baker Chemicals, USA
Joba BV, The Netherlands
KWR Chemical Ltd., UK
Lonza Ltd., Switzerland
Lux Chemicals, USA
Marcel Quarr and Cie, France
McKesson Chemicals, USA
Montedison, UK
Pioneer Salt and Chemicals, USA
Productora General de Perfumeria SL, Spain
Roland, Belgium
Rhone Poulenc, France
Schilling, Italy
T.R. International, UK

/Acetic Anhydride

Union Carbide, USA

Universal Preservam, USA

Versaillaise de Product Chimique, France

Wacker Chemie, F.R. Germany

White Court, UK

Wynmouth Lehr, UK

Raw Materials/Chemical Intermediates

Name of Product: Sulphadimidine

Name of Raw Material/
Chemical Intermediate: Acetyl Acetone

Name of Manufacturer/
Supplier:

Acetochemical Co., USA
Arnaud et SA Paymond, France
British Celanese Ltd., UK
Daicel, Japan
Devineau, France
Henley and Co., UK
Hopkin William, UK
Joba, The Netherlands
Schilling B.H., Italy
Union Carbide Corp., USA
Wacker Chemie, F.R. Germany
Westco Chemicals, USA

Raw Materials/Chemical Intermediates

Name of Product: Sulphadimidine

Name of Raw Material/Chemical Intermediate: Acetanilide

Name of Manufacturer/Supplier:

- Acetochemicals, USA
- Alba Chemicals, USA
- Albright and Wilson, UK
- AMC S.A. , France
- Bayer A.G., F.R. Germany
- Conary Chemicals, USA
- Dolder Ltd., Switzerland
- Erba Carlo, Italy
- Giusto Faravelli, Italy
- Hindustan Organic Chemicals, India
- Hoechst, Italy
- Hopkin William, UK
- Joba B.V., The Netherlands
- May and Baker, UK
- Merck, E., F.R. Germany
- Nipa Lab., F.R. Germany
- Orlex Chemicals, USA
- Rhone Poulenc, France
- Unipex, France

Raw Materials/Chemical Intermediates

Name of Product: Propranolol

Name of Raw Materials/
Chemical Intermediates Alphanaphthol

Name of Manufacturers/
Suppliers:

- ACN Aziende, Italy
- B.H. Schilling, Schilling Societá, Italy
- BDH Chemicals Ltd., UK
- Eayer A.G., West Germany
- Hopkins and Williams, U.K.
- Joba Ltd., Netherlands
- E. Merck, West Germany
- Union Carbide, USA

Raw Materials/Chemical Intermediates

Name of Product: Ampicillin

Name of Raw Material/Chemical Intermediate: 6 Amino Penicillanic acid

Name of Manufacturers/Suppliers:

- Aldrich Chemicals, USA
- Antibioticos, Spain
- Atabay, Turkey
- Bago Laboratorios, Argentina
- Bayer, F.R. Germany
- Biochemie, Austria
- Borge Pharmaceuticals, USA
- Bristol-Meyer, USA
- Centrala Industriala de Medicament, Romania
- Chemical Dynamics, USA
- Cipan, Portugal
- Deva, Turkey
- Fermentaciones Synthesis, Mexico
- Fermic S.A., Mexico
- Flavine International, USA
- Gist Brocade, The Netherlands
- Hoechst, F.R. Germany
- Medimpex, Hungary
- Meiji-Seiko, Japan
- Mexdexport, U.S.S.R.
- Mustafa Nevzat, Turkey
- Orion Pharmaceutica, Finland
- Orsabe S.A. Cuernacavo, Mexico
- Rhone Poulenc, France
- Takeda Chemicals, Japan
- Yang Jin, S. Korea

Raw Material/Chemical Intermediates

Name of Product: Paracetamol

Name of Raw Material/Chemical Intermediates: Para Aminophenol

Name of Manufacturers/Suppliers:

Nam

ACN Ziende C.N.A., Italy

Bayer AG., F.R. Germany

Boehringer Ingelheim, F.R. Germany

Chemapol, Czechoslovakia

Chemical Dynamics, USA

Hilton Davis Chemical, UK

Hoechst AG, F.R. Germany

Howard Hall International, USA

Hopkin William, UK

ICI, Belgium

J.H. Lowenstein and Sons, USA

Knoh Light Labs, UK

Mallinckrodt Inc., USA

Maypro Industries, USA

Orlex Chemicals Corp., USA

Pacific Gateway Co., USA

Rhone Poulenc Chemicals, France

Schilling, B.I.L. Italy

Sterling Organics, UK

Universal Preservachem, USA

Raw Materials/Chemical Intermediates

Name of Product: Ethambutol

Name of Raw Materials/Chemical Intermediates: D-2-Aminobutanol

Name of Manufacturers/Suppliers:

- American Cyanamid, USA
- American Hoechst Corp., NJ, USA
- Arnaud et SA Raymond, France
- Borg International, USA
- Chemische Werke, Lahr, FR Germany
- Farchemica di Martino, Treviglio, Italy
- Fluka, Buchs, Switzerland
- ICI, Blackley, Manchester, UK
- Klockner, W. Germany
- Lupin Laboratorias, Bombay, India
- Mediumpek, Hungary
- Raptakos Erett, India
- Rhone Poulenc, Chimia Fine, France

Raw Materials/Chemical Intermediates

Name of Product: Primaquine

Name of Raw Material/Chemical Intermediate: P-Anisidine

Name of Manufacturer/Supplier:

Aceto Chemical Co., USA
Bayer AG., F.R. Germany
Bayer Chimi, France
Biddle Sawyer, USA
Du Pont De Nemour International, Switzerland
Hoechst AG., F.R. Germany
Hopkin and William, UK
E. Merck, F.R. Germany
Orlex Chemicals, USA
Rhone Poulenc, France
Schilling B.H., Italy
Unipex, France

Addendum: I.C.I., UK

Raw Materials/Chemical Intermediates

Name of Product: Chloroquine Phosphate

Name of Raw Materials/
Chemical Intermediates: 1-Chloroaniline

Name of Manufacturers/
Suppliers:

- ACNA, Casella, Milan, Italy
- American Hoechst Corporation, Somerville, NJ, USA
- Bayer AG, Bayerwerke, W. Germany
- BDH Chemicals, Poole, Dorset, UK
- P.H. Schilling Chimica, Italy
- Du Pont de Nemours, USA
- Clayton Aniline, Clayton, Manchester, UK
- Hoechst, Frankfurt, W. Germany
- Fickson and Welsh, Castlefield, UK
- Hopkin and Williams, UK
- I.C.I., Blackley, Manchester, UK
- Maypro Industries, New York, USA
- Merck, Darmstadt, W. Germany
- Mitsubishi Chemicals, Tokyo, Japan
- Orlex Chemical, Farlawn, NJ, USA
- Ravand et Monscade, France
- Vicker Labs, Burley in Wharfedale, Ilkely, UK

Raw Materials/Chemical Intermediates

Name of Product: Furosemide

Name of Raw Material/
Chemical Intermediates: Chloroanthranilic Acid

Name of Manufacturer/
Supplier: Fabbrica Italiana, Italy
National Chemical Corporation, USA
S.S.T. Corporation, USA

Raw Materials/Chemical Intermediates

Name of Product: Dapsone

Name of Raw Materials/
Chemical Intermediates: P Chloronitrobenzene

Name of Manufacturers/
Suppliers:
Bayer U.K. Ltd. Richmond, UK
P.D.H. Chemicals UK
Ciba Geigy, Whittleford, Cambridge, UK
Dow Chemicals, Baslow, UK
Du Pont de Nemours, USA
Fickson and Welch, UK
Hoechst Intermediate Div., Somerville, USA
Hopkins and Williams, UK
Medexport, Moscow, USSR
Mitchell, Cotts. Mirfield, UK
Monsanto Chemical Intermediates, St. Louis, USA

Raw Materials/Chemical Intermediates

Name of Product: Furosemide

Name of Raw Material/Chemical Intermediate: Chlorosulphone Acid

Name of Manufacturer/Supplier:

- A.C.N.A. Aziendena, Italy
- Aldrich Chemicals, USA
- Bayer A.G., F.R. Germany
- Chemapol, Czechoslovakia
- Dupont De Nemour, USA
- Hoechst A.G., F.R. Germany
- I.C.I., UK
- Kum Yang Co., USA
- Monsanto, USA
- Productora Generale de Perfumaria, Spain
- Rhone Poulenc, France
- Societe d'Equipment Industrial Ele, France
- UCB, Belgium

Raw Materials/Chemical Intermediates

Name of Product: Mebendazole

Name of Raw Materials/
Chemical Intermediates: 3:4 Diaminobenzo-phenone

Name of manufacturer/
Supplier: Biosynth International, USA

Chemical Dynamic, USA

Delmar Inc., USA

FDC, Bombay, India

Janssen Pharmaceutica, Belgium

Raw Materials/Chemical Intermediates

Name of Product: Dapsone

Name of Raw Materials/
Chemical Intermediate: 4:4 Dichlorodiphenylsulfone

Name of Manufacturers/
Suppliers:

Aldrich Chemicals, USA
BASF, F.R. Germany
Birk Clover, USA
China National Corporation, China
Ferak Berlin OHG, Berlin, W. Germany
K and K Laboratories, Plainview, USA
Schuchardt, Dr. Theodor, München, W. Germany
Wasgchemie, Werk Schan Kavaiburg, U. Germany

Raw Materials/Chemical Intermediates

Name of Product: Furosemide

Name of Raw Material/
Chemical Intermediate: 4:6 Dichlor-3 Sulfamoylbenzoic acid

Name of Manufacturer/
Supplier: Biosynth International, USA
Chemical Dynamics, USA
Medimpex, Hungary
Polar, Finland

Raw Materials/Chemical Intermediates

<u>Name of Product:</u>	Chloroquine Phosphate
<u>Name of Raw Materials/ Chemical Intermediates</u>	4:7 Dichlorquinoline
<u>Name of Manufacturers/ Suppliers:</u>	MASF, F.R. Germany Chemical Dynamics, NJ, USA Horkins and William, UK ICI, Millbank, London, UK Medimpex, Budapest, Hungary Orlex Chemicals, Fairlawn, NJ, USA SST Corporation, Clifton NJ, USA

Raw Materials/Chemical Intermediates

Name of Product: Ampicillin

Name of Raw Material/ N:N Dimethylaniline
Chemical Intermediate:

Name of Manufacturers/ Aceto Chemicals, USA
Suppliers: Buffalo Colour Corp., USA
Dupont De Nemour and Co., USA
Fairmount Chemical Co., USA
Hopkin and Williams, UK
Inland Chemicals, USA
Orlex Chemical Corp., USA
Schilling B.H. Societa Chemica, Italy
Universal Preservachm, USA

Raw Materials/Chemical Intermediates

Name of Product: Diethylcarbamazine

Name of Raw Material/
Chemical Intermediate: Diethylcarbamylchloride

Name of Manufacturer/
Supplier:

- Aldrich Chemical, USA
- BASF, F.R. Germany
- C.H.G. und Blau, F.R. Germany
- Essex Chemical Corp., USA
- Kennedy and Klim, USA
- National des Poudres et Explosifs, France
- Schilling R.H., Societea Chemica Spa, Italy

Raw Materials/Chemical Intermediates

Name of Product **Chloroquine Phosphate**

Name of Raw Materials/
Chemical Intermediates **Diphenyloxide**

Name of Manufacturers/
Suppliers:
Alfa Chemicals, Tenafly NJ, USA
R.W. Schilling Chimica, Italy
Dow Chemicals, Ranslow, UK
Civandan (SAPI), France
ICI, (France), France
Monsanto Chemicals, St. Louis, USA

Raw Materials/Chemical Intermediates

Name of Product: Propranolol

Name of Raw Materials/
Chemical Intermediates Epichlorohydrin

Name of Manufacturers/
Suppliers:
Dow Chemicals, USA
Mc Kesson Chemicals, USA
Shell Chemicals, USA

Raw Materials/Chemical Intermediates

Name of Product: Ethambutol

Name of Raw Material/Chemical Intermediates: Ethylene Dichloride

Name of Manufacturers/Suppliers:

- Arnaud SA, France
- Bayer AG, W. Germany
- Coneo Chemicals, Houston, USA
- Dow Chemicals, Midland, USA
- Ethylgroupchemicals, USA
- Great Lake Chemicals, Lafayetta, USA
- Hopkin and William, UK
- Pan Britanica Ind., Waltham Cross, UK
- PPG Chemical, Pittsburg, USA
- Montedison, Italy
- Rhone Poulenc, France
- Sherman Chemical, Bedfordshire, UK
- Union Carbide SA, Switzerland

Raw Materials/Chemical Intermediates

Name of Product: Erythromycin

Name of Raw Material/
Chemical Intermediates: Erythromycin Thiocynate

Name of Manufacturer/
Supplier:
Abbot Laboratories, USA
Chemi Kalien A.G., F.R. Germany
Cipan, Portugal
Compania Espanola de la Penicillina y
Antiobioticos, Spain
Upjohn Co., USA

Raw Materials/Chemical Intermediates

Name of Product: Ethinylestradiol

Name of Raw Material/
Chemical Intermediates: Estrone/Estradiol and Salts/Esters

Name of Manufacturers/
Suppliers:

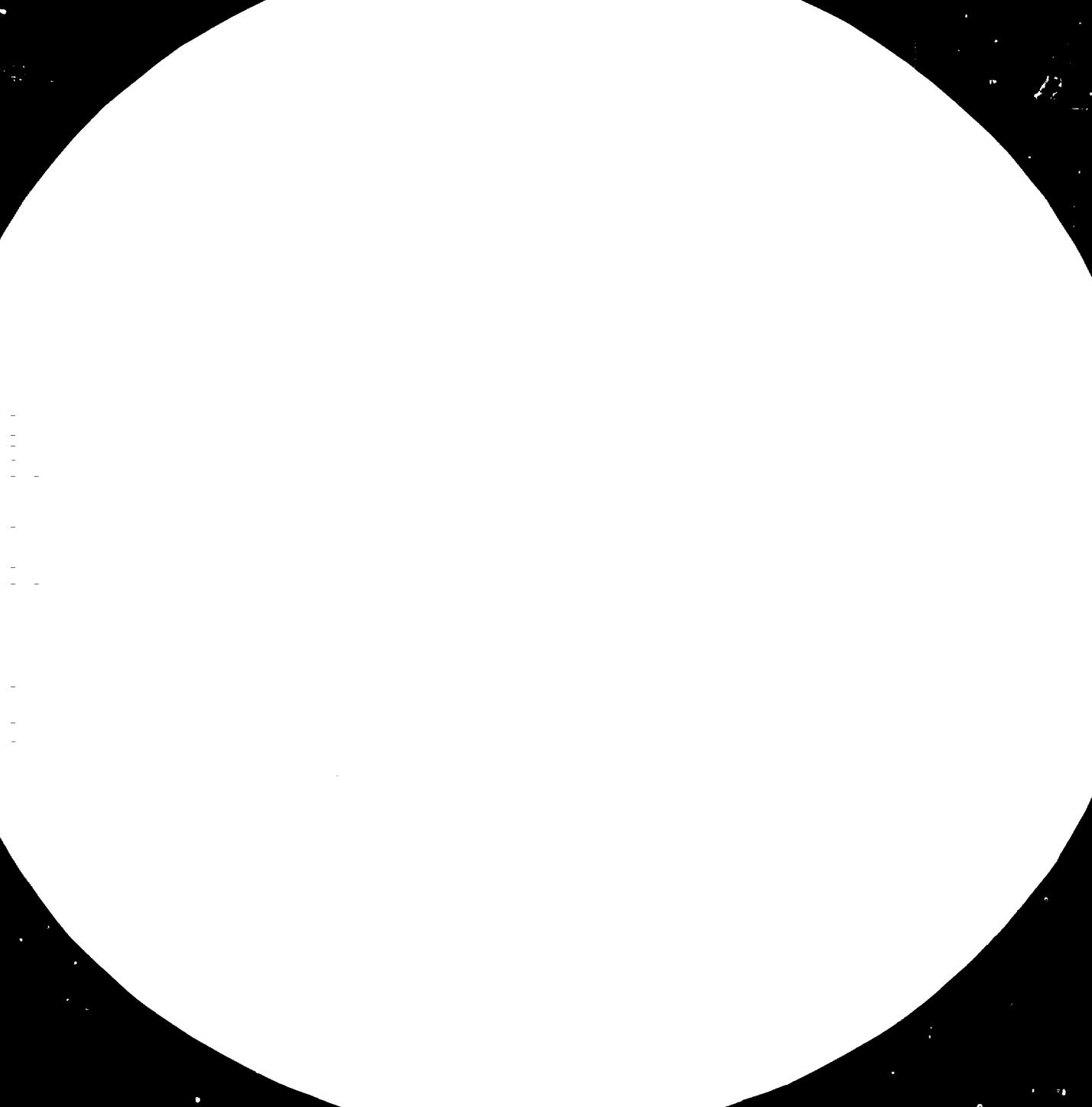
Alwitt, UK
Delmar Inc., USA
Dolder, Switzerland
Henley, USA
Napp Chemicals, USA
Organon Inc., USA
Roussel Corporation, USA
Searle, USA

Raw Materials/Chemical Intermediates

Name of Product: Piperazine

Name of Raw Material/
Chemical Intermediate: Ethylene Diamine Hydrochloride

Name of Manufacturer/
Supplier:
Ethyl Chemicals, USA
Hetako Chemicals, Switzerland
R.S.A. Corporation, USA
Texaco Chemicals, USA





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2.2



2.0

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Raw Materials/Chemical Intermediates

Name of Product: Isoniazid

Name of Raw Material/
Chemical Intermediate: Gamma Picoline

Name of Manufacturer/
Supplier:

Browning Chemical Corporation, USA
Chemapol Ltd., Czechoslovakia
China National Corporation, China
Croda Synthetic Chemicals, UK
FBA Pharmaceuticals, USA
Joba B.V., The Netherlands
Merck, E., F.R. Germany
Miki Sangyo, USA
Montedison Deutschland, F.R. Germany
Nepera Chemicals, USA
Reilly Tar and Chemicals, USA
Schilling B.H., Italy
T.R. International, UK
Union Carbide Corp., USA
Wynmouth Lehr, UK

Raw Materials/Chemical Intermediates

Name of Product: Sulphadimidine

Name of Raw Material/Chemical Intermediate: Guanidine Nitrate

Name of Manufacturers/Suppliers:

- Advent Chemicals, USA
- American Drug and Chemicals, USA
- Chemical Dynamics, USA
- Hoechst A.G., F.R. Germany
- Hummel Chemical, USA
- Joba, The Netherlands
- Nippon, Japan
- Ortex Chemical, USA
- Ravit, Italy
- Schilling B.H., Italy
- Schuchardt Theodor, F.R. Germany
- Unwin R.W., UK
- Versaillaise de Produit Chimiques, France

Raw Materials/Chemical Intermediates

Name of Product: Isoniazid

Name of Raw Material/Chemical Intermediate: Hydrazine Hydrate

Name of Manufacturer/Supplier:

- Albright and Wilson Chemicals, U.K.
- Aceto Chemicals, USA
- Biddle Saw Year Corp., USA
- China National Corporation, China
- Comptoir Chimique Continental, France
- Conray Chemicals, USA
- D and O Chemicals, USA
- FBA Pharmaceuticals, USA
- Greef, R.W. and Co., USA
- Otsuka Chemicals, Japan
- Product Chimiques, France
- Roland S.A. Belgium
- RP Chemicals, USA
- Steetley Corporation, UK
- Thorson Chemicals, USA
- United Mineral and Chemicals, USA

Raw Materials/Chemical Intermediates

Name of Product: Isoniazid

Name of Raw Material/
Chemical Intermediates: Isonicotinic Acid

Name of Manufacturers/
Suppliers:

- Alwitt, UK
- Bayer A.G. F.R. Germany
- Bofors Lakeway, USA
- Chemical Dynamics, USA
- Dolder, Switzerland
- Reilly Tar Chemicals, USA
- Schilling, B.II., Italy
- Unipex, France

Raw Materials/Chemical Intermediates

Name of Product: Propranolol

Name of Raw Materials/Chemical Intermediates: Isopropylamine

Name of Manufacturers/Suppliers:

- Air Products and Chemicals, USA
- Ashland Chemicals, USA
- EAST, Parsippany, N.J. USA
- Brenntag, Germany
- Chemtech Industries, St. Louis, USA
- Hoechst A.G., F.F. Germany
- Mc Kesson Chemicals, USA
- Merck, W. Germany
- Union Chemicals, USA
- Union Carbide, UK
- Univar Chemicals, USA

Raw Materials/Chemical Intermediates

Name of Product: Diethylcarbamazine

Name of Raw Material/Chemical Intermediate: 1 Methylpiperazine

Name of Manufacturer/Supplier:

- Aldrich Chemicals, USA
- BASF, France
- B.H. Schilling, Italy
- Chemical Dynamics Corp., USA
- D and O Chemicals, USA
- Delmar Inc., USA
- Dow Chemicals, USA
- Greef R. W. and Co., USA
- Merck, F.R. Germany
- Miki Sangyo, USA
- R.S.A. Corp., USA
- Rexolin Chemicals, Sweden
- S.S. T Corp., USA
- Thomson and Joseph, UK
- Versaillaise de Produits Chimiques, France

Raw Materials/Chemical Intermediates

Name of Product: Piperazine

Name of Raw Material/Chemical Intermediate: Mono Ethanolamine

Name of Manufacturer/Supplier:

- Alpha International Chemicals, USA
- Aranaud S.A., France
- Ashland Chemical, USA
- BASF, F.R. Germany
- BDH, UK
- Centrala Industriala, Romania
- Chemcentral Corp., USA
- Comptoir Chimique, France
- Fallek Chemical, Belgium
- ICC Industries, The Netherlands
- ICI, UK
- Lux Chemicals, USA
- Merck, F. R. Germany
- Pioneer Salt and Chemicals, USA
- Schilling B.H., Italy
- Shell Chemicals, UK
- Stinnes Oil and Chemicals, USA
- Texaco, UK
- Union Carbide, UK
- Union Chemicals, USA
- Universal Preservachem, USA

Raw Materials/Chemical Intermediates

Name of Product: Dapsone

Name of Raw Materials/Chemical Intermediates 1:4 Nitrobenzene

Name of Manufacturers/Suppliers

- American Cyanamide, Wayne, USA
- BASE, Ludwigshafen, West Germany
- Bayer A.G., West Germany
- Brown Poveri, Mannheim, Denmark
- Comptoir Chimique, France
- Dupont de Nemours, Wilmington, USA
- Giusto Faravelli, Italy
- First Chemical Corporation, Jackson, USA
- Hickson and Welch, Castleford, UK
- Ioechst A.G., West Germany
- I.C.I., Manchester, UK
- Industrie Chimique, France
- Lonza Ltd., Switzerland
- Merexport, Moscow, USSR
- May and Baker, Dagenham, UK
- Nagasse, Dusseldorf, West Germany
- Strang Chemicals Ltd., UK
- Versaillaise de Produits Chem., France

Raw Materials/Chemical Intermediates

Name of Product: Chloroquine Phosphate

Name of Raw Materials/
Chemical Intermediates
Novaldiamine (5 Diethylamino 2 - amino pentane)

Name of Manufacturers/
Suppliers:
BASF, Ludwigshafen, W. Germany
ICI, London, UK
Rhone Poulenc, Paris, France
Sterling Drug, New York, USA

Raw Materials/Chemical Intermediates

Name of Product: Ampicillin

Name of Raw Materials/
Chemical Intermeidates: D Phenylglycine

Name of Manufacturer/
Suppliers:

- Aceto Chemicals, USA
- Bentex Chemicals, USA
- Chemical Dynamics, USA
- ICN- Acro SA, Switzerland
- Greef R.W., USA
- Kay Fries (Dynamite Nobel), USA
- Nippon, Japan
- Tanabe, Japan
- Upjohn Co., USA
- Wall Chemicals, USA
- Wilshire Chemicals Co., USA

Raw Materials/Chemical Intermediates

Name of Product: Acetylsalicylic acid

Name of Raw Material/Chemical Intermediate: Salicylic acid

Name of Manufacturer/Supplier:

A.C. Industries, USA
Albright and Wilson, UK
Alta Laboratorios, India
Arcode, UK
Aziende Colori Nazionali Affini, Italy
J. T. Baker Chemicals, USA
Bayer AG, F.R. Germany
Bentex Chemicals, USA
Browning Chemicals, USA
Chemphora Chemische, The Netherlands
Comptoir Chimique, France
Dolder Ltd., Switzerland
Dow Chemicals, USA
Eurochemiec S.A. France
Flavine International, USA
Giusti Faravelli, Italy
Grasser Salicylate, UK
Hilton Davis, UK
Joba B.V., The Netherlands
Lars Christensen, Denmark
MWM Chemicals, USA
Monsanto, UK
Ortex Chemicals, USA
Polfa, Poland
Productora Generale de Perfumaria, Spain
Roland, Belgium
R.W. Unwin, UK
Rhone Poulenc, USA
Schilling B.H., Italy
Sterling Drug Co., USA
Versaillaise de Produits Chimiques, France
White Court, UK

Raw Materials/Chemical Intermediates

Name of Product: Ascarbic Acid

Name of Raw Materials/Chemical Intermediate Sorbitol

Name of Manufacturer/Supplier:

- Advent Chemicals, USA
- Alwitt, UK
- Bayer A.G., F.R. Germany
- Biddle Sawyer, USA
- Chemapol, Yougoslavia
- Conary Chemical, USA
- Davos Chemical, USA
- Hefti, Switzerland
- Helm New York Chemicals, USA
- Instituto Chemterapico Italiano, Italy
- Joba, The Netherlands
- Laporte Industries, UK
- Lar Christensen, Denmark
- Lonza Inc., USA
- Maypro Industries, USA
- Merck and Co., USA/F.R. Germany
- Mitsui, USA
- Pacific Gateway, USA
- Pfizer, USA
- Roland, Belgium
- Schilling E.H., Italy
- Steetley Chemicals, UK
- S.S.T. Corporation, USA
- Stinnes Oil and Chemicals, USA
- Synthetic, Denmark
- Universal Preservacum, USA
- Union Chimique, France
- Westco Chemicals, USA

Raw Materials/Chemical Intermediates

Name of Product: Sulphadimidine

Name of Raw Material/Chemical Intermediate: Sulphaguanidine

Name of Manufacturer/Suppliers:

- Aceto Chemicals, USA
- Agvar Chemicals, USA
- Archemia, Italy
- Chemapol Ltd., Czechoslovakia
- Dolder, Switzerland
- Fallek Products Int., The Netherlands
- Flavine International, USA
- Giusto Faravelli, Italy
- GYMA Laboratories, USA
- Howard Hall, USA
- ICI, UK
- Joba B., The Netherlands
- Lars Christensen, Denmark
- Maypro Industries, USA
- MWM Chemicals, USA
- Pliva, Yugoslavia
- Polfa, Poland
- Schilling BH, Italy
- S.E.I.A., France
- Strang Chemicals, UK
- Syntetic AS, Denmark
- Thomson and Joseph, UK
- Union Chemique, France
- Unwin R.W., UK

Raw Materials/Chemical Intermediates

Name of Product: Dapsone

Name of Raw Material/
Chemical Intermediate: Sulphurylchloride

Name of Manufacturers/
Suppliers:

- BASF Wyandotte Corp, USA
- Bayer AG, F.R. Germany
- Chemische F. Schweizerhall, Switzerland
- Erba Carlo, Italy
- Hooker Chemicals, USA
- Société de Equip. Industriel, France

Raw Materials/Chemical Intermediates

Name of Product: Tetracycline

Name of Raw Material/Chemical Intermediate: Tetracycline Arquad Salt,
Tetracycline Urea Complex, Demethylchlortetra
Cycline Urea Complex

Name of Manufacturers/Supplier:
Cipan, Portugal
Compania Espanola de la P. Antibioticos, Spain
Hoechst A.G., F.R. Germany
Pfizer, USA
Sterling Organics, USA

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SECTION III

ADDRESSES OF MANUFACTURERS/SUPPLIERS

ADDRESSES OF MANUFACTURERS/SUPPLIERS

Abbot Universal,
Abbot Park,
400 Sheridan Road,
North Chicago,
Ill. 60064
U.S.A. (Telex 910-235-1584)

Albright and Wilson,
475 Walnut Street,
Norwood,
N.J. 07648,
U.S.A. (Tel: 767-3014)
(Telex: 130345)

AC Industries, Sattva Chemicals Corp.,
P.O. Box 1335,
Stanford,
U.S.A. (Telex 96-5807)

Albright and Wilson,
March on Works,
White Haven,
CA28 9QQ,
United Kingdom

ACIC,
40 St. Clair Ave.,
East Suite 301,
Toronto,
Canada

Albright and Wilson,
Oldbury,
Worsc. B694 ,
United Kingdom

Acna,
Aziendi Casella Postale 3996,
30100 Milan,
Italy

Alba Chemicals Inc.,
285 Country Road,
Tenafly,
N.J. 07670,
U.S.A. (Tel: 569-3636)
(Telex: 642139)

Aceto Chemicals,
126-02, North Blvd.,
Flushing,
N.Y. 11368,
U.S.A. (Telex 62662)

Alembic Products,
Oaklands House,
Oakland Drive,
Manchester,
United Kingdom (Telex 667740)

ACF Chemifama N.V.,
P.O. Box 5,
Maarsen,
The Netherlands

Alembic Chemicals,
Alembic Road,
Baroda,
India

Ache Laboratories S.A.
San Paulo,
Brazil

Aldrich Chemicals ,
940 W. St. Paul Ave.,
Millwankee,
W.I.
U.S.A. (Telex 268434)

Advent Chemical,
527 Madison Ave,
New York,
N.Y. 10022,
U.S.A.

Allied Chemicals,
P.O. Box 2500,
Somerville N.J. 08876,
U.S.A.

Agvar Chemicals,
One Lincoln Plaza,
New York,
N.Y.
U.S.A. (Telex 237704-Agvar)

Alpha Therapeutic Corp.,
555 Valley,
Los Angeles,
CA 90032,
U.S.A.

Air Products and Chemicals,
P.O. Box 538,
Allentown,
Penn. 18105,
U.S.A.

Alta Laboratories,
F.O. Box 7019,
Dadar,
Bombay,
400028,
India

Alagoas Materias,
Primas Maccio,
Alagoas,
Brazil

Alwitt,
Zelidi House,
2-4 Mountephram,
Tunbridge Wells,
Kent,
United Kingdom (Telex 95146)

Amcel Europa S.A. Chemicals,
Avenue Louise 251,
1050 Bruxelles,
Belgium

American Cyanamide,
Berdan Ave.,
Wayne, New Jersey,
N.J. 07470,
U.S.A. (Tel: 831-200)
(Telex: 130400)

American Drugs and Chemicals,
17901 San Fernando Road,
Sun Valley,
CA 91352
U.S.A.

American Roland Corp.,
157, Chamber Street,
New York,
N.Y. 10007,
U.S.A. (Tel: 349-0170)
(Telex: RCA 222 771)

Amphray Laboratoris,
Sambava Chamber 4th Floor,
Sir P.M. Road,
Bombay,
India

Angelini Spa.,
Viale Amelia 70,
00181 Roma,
Italy. (Tel: 7933)
(Telex: 611427)

Ankerfarm SpA,
Casella Postale 42,
20092,
Cinisello, Balsamo,
Milan,
Italy

Antibioticos S.A.,
28 Bravo Murillo,
Madrid-3,
Spain (Tel: 436-1000)
(Telex: 22933 Antib E)

Ansa Antibiotics,
Ankara,
Anfalti K'osekoy Merkii,
PK 54,
Izmit,
Turkey

Atrial Laboratories S.A.R.L. A,
Gomes Pereira 74,
1500 Lisbon,
Portugal. (Tel: 704151)
(Telex: 12241)

Astra A.B.,
15185 Sodertalje,
Sweden (Tel: 32980)
(Telex: 19237)

Ashi Chemicals Industry,
Mitsui Building,
1-2 Yurakacho,
1 Chome Chiyoda Ka.,
Tokyo,
Japan (Telex: 222 3518 Bermbrg)

Ashland Chemicals,
P.O. Box 2219,
Columbus,
Ohio,
U.S.A. (Tel: 889-3333)
(Telex: 245385)

Asia Pharmaceuticals,
413-13,
Shindorim Dong,
Kuru Ku,
Seoul-150,
S. Korea

Archemia,
Via Paglino 21,
20149,
Milano,
Italy

Archifar S.p.a.,
18 Via Trivulzio 20146,
Milan,
Italy.

Arcode Ltd.,
Plantatim House,
Mincing Lane,
London E.C.
United Kingdom

Armour Pharmaceuticals Co.,
6991 E. Camelback Road,
Suite A-210,
Scottsdale,
AZ 85251,
U.S.A.

Arnaud Chemicals,
21 rue Champ Elysees,
38 Grenoble,
France

Atabay,
Esentepe,
Kasap Sokak,
No 13, Levent,
Istanbul,
Turkey.

Ayrest Laboratories,
685 Third Ave.,
New York,
U.S.A.

Bago Laboratories,
Bernardo de Irigoyen 248
1407 Buenos Aires,
Argentina.

Bayer AG.,
D-5090 Leverkusen
Bayerwerk,
F.R. Germany (Tel: 301)
(Telex 81510881)

BASF,
(Badische Anilin and Soda Fabrik A.G.)
6700 Ludwigshafen,
Rhein,
F.R. Germany
(Tel: 601)
(Telex: BASF Ludwigshafen)

BASF Wyandotte Corp.,
100 Cherry Hill,
Parsippany,
N.J. 07054,
U.S.A.

Banyo Pharmaceuticals,
7-2 Chome,
Nihonbashi,
Honcho,
Chuo-ku,
Japan

Baker Chemicals,
Philiphburg,
New Jersey 08065,
U.S.A.

Benaco Soc. die R.L. Donato,
Lonato Brescia,
Italy.

BEC Chemicals,
Victoria Building,
Abdullah Brelvi Road,
Fort ,
Bombay,
India (Telex: 011-2560)

B.D.H. Chemicals,
Poole,
BH 124 NN,
United Kingdom.

Behringwerke Aktiengesellschaft,
Postfach 1140,
D-3550 Marburg,
F.R. Germany.

Bengal Chemicals Co.,
Ganesh Chandra Ave.,
Calcutta 700013,
India.

Bentex Chemicals,
One Main Street,
Chatham,
N.J. 07928,
U.S.A. (Tel: 635-4841)
(Telex: 642-507)

Beecham Group Ltd.,
Beecham House,
Great West Road,
Brentford,
Middlesex ,
United Kingdom (Telex: 22743)

Beta Chemicals,
Gannow Lane,
Rose Grove,
Burnley,
BB 126JJ
United Kingdom.

Birk Glover,
Mont and Lincoln Ave.,
New Albany 47150,
U.S.A.

Biocest Serum Institute Gmbh.,
Postfach 730260,
D-6000,
Frankfurt 73,
F.R. Germany

Biddle Sawyer Corp.,
2 Penn Plaza,
New York,
U.S.A.

Biochemie Gmba.,
A-6250,
Kundl,
Tirol,
Austria (Tel: 05338-611)
(Telex: 051107)

Biosynth Inst.,
P.O. Box 541,
Skokie, ILL 60076,
U.S.A.

Boehringer Ingelheim GmbH.,
Postfach 200,
D-6507,
Ingelheim,
F.R. Germany

Boehringer Mannheim GmbH.,
P.O. Box 51,
Sandhofer Strasse,
112/124, 6800 Mannheim Wf.,
F.R. Germany (Tel: 75011)

Borge International Inc.,
52, First Street,
Hackensack,
N.J. 07601,
U.S.A. (Tel: 487-500)
(Telex: 135391 Borg)

Bofors A.B.
P.O. Box 800,
S-69020,
Bofors,
Sweden

Bofors Lakeways Inc.,
206 Westfield Ave.,
Clark,
N.J. 07066,
U.S.A.

Bristol Laboratories,
32 rue de la Arcade,
75008 Paris,
France

Bristol Meyer,
345, Park Ave.,
New York,
N.Y. 10154,
U.S.A. (Telex: (212) 644 2100)

Brenntag,
Post Office 010320,
Reichs Prasidentstrasse 21-25,
4330 Mulheim,
F.R. Germany

Browning Chemicals
330 Mardison Ave.,
New York,
NY 10017, (Telex:TCA 235 039)

Byron Chemicals Co.,

40-11,
23rd Street,
Long Island,
NY 11101
USA (Tel:786-8441)
(Telex: TCA 224 255)

B.P. Chemicals,
620 5th Avenue,
New York,
NY
U.S.A.

Bufflo Colon Corp.,
1 Garret Mountain Plaza,
West Paterson,
N.J. 07424,
U.S.A.

Burroghs Wellcome,
16 Bank Street,
P.O. Box 290,
Bombay,
India

C.H.G. Blu,
Scholvin,
Glockengisserwall 26,
2000 Hamburg I,
F.R. Germany

Carlo Erba Farmitalia Spa.,
via Carlo Imbonati 24,
Milan 20159,
Italy (Telex: Erba 36314 MI)

Caveteco S.A.Q/I.,
Ave. Belgrano 1281,
1093 Buenos Aires,
Argentina.

Charles Tennant & Co.,
69, Grosvenor Street,
London W1X OBP,
United Kingdom.

Celanese Chemicals,
1250 Mockingbird Lane,
Dallas,
Texas,
U.S.A.

Centerchem Inc.,
475 Park Ave.,
New York,
NY 10016,
U.S.A. (Telex: 223322 ECC)

Centrala Industria la Medic,
Coloranti Si Lacuri,
Bucharest,
Bd. Ion Suba,
246 S 111,
Rumania.

Chemikalian A.G.,
Schluterstrasse 37,
1000 Berlin 12,
F.R. Germany (Telex: 183404)

Chemical Dynamics,
395 South Plainfield,
NJ 07080,
U.S.A.

Chemicals and Feeds,
Adelaide House
King William Street,
London EC 4,
United Kingdom.

Chemical and Pharmaceutical Laboratories,
289, Ballasis Road,
Bombay,
India

Chemische Werke Lahr,
Kaiser Strasse 95,
7630 Lahr,
F.R. Germany

Chemia Industria Spa,
Via delle,
Fonti 341,
Prato,
Italy

Chemphora Chemische Producten,
PB 35,
Lindtsedijk 2,
Zwijndrecht,
The Netherlands (Telex 22108)

Chemtech Industries,
1655 Des Peres Rond,
St. Louis,
MO 63131,
U.S.A.

Chemapol Ltd.,
Kodanska 46,
Praha 10/100, 10,
Czechoslovakia.

Charles Tennant and Co.,
69 Grosvenor Street,
London W1X OBP
United Kingdom (Telex: 23335)

China National Chemicals,
Erli Li Kou,
Hsi Chiao,
Peking,
China.

Choay Laboratories,
46, Ave. Theophile,
Gantier F,
75782,
Paris,
France.

Chong Kun Dong Corp.,
410 Shindorim Dong,
Kuro Ku Seoul 150,
South Korea.

Christian Brunnengraeber Chemische
Fabrik GmbH.,
Postfach 2052,
D-2400,
Luebeck,
F.R. Germany

Ciba-Geigy Ltd.,
CH-4002 Basel,
Switzerland (Tel: 061-325011)
(Telex: 62991)

Cipan Sarl.,
Gomes Pereira Avenue,
74-1500,
Lisbon,
Portugal (Tel: 704151)
(Telex: 12241)

Clayton Aniline Ltd.,
Clayton,
Manchester,
United Kingdom.

Compania Espanola da Penicillina,
Antibioticos S.A.,
Alcala 95,
Madrid,
Spain (Telex: 45448 E)

Companhia Brasileria de Antibioticos,
Rue Pontes Correa 51,
2051 Rio de Janerio,
Brazil.

Compotoir Chimique,
BP26,
11 Premiere Ave.,
13741 Vitrolles,
Cedex,
France (Tel: 899383)
(Telex: Kontiki 420320)

Conoco Chemicals,
P.O. Box 2197,
Houston,
U.S.A.

Conary Chemicals,
P.O. Box 848,
97 Ongley Street,
Rockville Centre,
NY 11571,
U.S.A.

Connaught Laboratories,
Toronto,
Canada

Cosima P.V.B.A.
P.O. Box 14,
2610 Wilrijk,
Belgium (Tel: 031272419)

Croda Chemical Ltd.,
Cowick Hall,
Snaithgoole,
Yorks D N14 9AA,
United Kingdom

Curewell Ltd.,
72 Ring Road,
Lajpat Nagar III,
New Delhi,
110024,
India.

C Van Epenhuysen's Chemische,
Fabrieken,
P.O. Box 11,
Noodweg 3,
Zwijndrecht,
The Netherlands.

Daicel Ltd.,
Kokusi Building 2-30 Azuchionachi,
Higashi Ku,
Osaka 541,
Japan

Davon Chemicals,
P.O. Box 5220,
Princeton N.J. 08540,
U.S.A.

Davos Chemicals,
2500 Lemoine Ave.,
Fort Lee,
N.J. 07024,
U.S.A. (Telex: 135 422)

Degussa Ltd.,
175 Tottenham Court Road,
London,
United Kingdom.

Delmar,
2653 Greenleaf Ave.,
Elk Grove Village,
Ill.
U.S.A. (Telex: 287443)

Deva,
4 Levent Gultepe,
Kavsgi No. 199,
Istanbul,
Turkey.

Devineau S.A.
26 rue Lafayette,
Paris 75009,
France (Tel: 824 7040)
(Telex: 65754)

Diamond Shamrock,
350 Mt. Kemble Ave.,
Morristown,
NJ 07960,
U.S.A.

Diosynth,
P.O. Box 20,
Kloosterstrat 6,
The Netherlands (Telex: 50222)

Distilleri Italiano SPA.,
Pizza Duca,
D-Aosta,
8B Milano 20124,
Italy

Dolder Lt.,
Immengase 9,
P.O. Box CH-4004,
Basel,
Switzerland.

Dong Wha Pharma,
5 Sunwha Dong,
Chung-Ku,
Seoul 110,
S. Korea.

Dow Chemicals,
Bennet Building 2030,
Dow Centre Midland 48640,
U.S.A. (Tel: (517) 636 1000)
(Telex: 8102 669490)

Dow Chemicals Europe,
CH-8810,
Horgen,
Switzerland (Tel: (01) 72 82 111)
(Telex: 835420)

Du Font De Nemour,
1007 Market Street,
Wilmington DE 19898,
U.S.A. (Tel: 774-2421)
(Telex: 835420)

Duphar Interfram Ltd.,
Shivsager Estate,
Dr. A. B. Road,
Bombay,
India

Dynamite Nobel A.G.,
Postfach 1180,
Seezle,
F.R. Germany

Eastman Chemicals International,
Kodak House,
Hemel Hempstead,
Herts.
United Kingdom

Eastman Chemicals,
P.O. Box 431 Kingport,
TN 37662,
U.S.A.

Eisen Pharmaceuticals Co.Ltd.,
34/7 Erandwana,
Gulwani,
Maharaj Marg Pune, 411004,
India

El Nasr,
Abou Zambal,
Cairo,
Egypt.

Eli Lilly,
Indianapolis,
Indiana,
U.S.A.

Essex Chemicals Corp.,
3520 Fairfield Road,
Baltimore MD 21226,
U.S.A. (Tel: 355-9090)
(Telex: 710234)

Ethylgroup Chemicals,
451 Florida Street,
Baton Rouge,
U.S.A.

Eurolatin Pharmaceuticals,
Urbina 18,
Mexico DF,
Mexico.

Exico Ltd.,
34-36 Grays Inn Road,
London WC1
United Kingdom (Telex: 28211)

Fabrica Italiana Sintetici SpA.,
26 Alte,
Montecchio Maggiore,
Vinzenza,
Italy

Fallek Chemicals Co.,
460 Park Ave.
New York,
NY 10002,
U.S.A. (Tel: 752 0250)
(Telex: 148395)

Fallek Products International,
Koningssiaan,
19 P.O. Box 7494,
Amsterdam,
The Netherlands. (Tel: 763333)
(Telex: 16293)

Fako,
4 Lavent,
Talapsa Caddesi,
Galtepe Kavasagi,
P.O. Box 204,
Sisli,
Istanbul,
Turkey.

Far Chemia De Martino,
Treviglio,
Italy.

Farmitalia - Farmaceutici,
Viale Bezzi 24,
Milan,
Italy (Telex: 31415)

Farmitalia Carlo Erba,
Via Carlo Imbonati 24,
20159 Milan,
Italy (Tel: (02) 69951)
(Telex: 330314 Erba I)

Farmaceutica Milanese,
Seragino Belfanti,
20 Via Darwin,
Milan,
Italy.

Fairmount Chemical Co.
117, Blanchard Street,
NJ 07016,
U.S.A.

Farmos Group,
P.O. Box 425,
SF 20101,
Turku 10,,
Finland (Tel: 958 21382)
(Telex: 61114 Fayht)

FBA Pharmaceuticals,
Mobay Corp.,
425 Park Ave.,
New York
NY 10022,
USA (Telex: 12500 INT)

FDC,
66 Lakhmi Building,
Sir P.M. Road,
Bombay 40001,
India (Telex: 011-5713)

Ferak Berlin,
1000 Berlin West,
Friedrichsbrunner Strasse 3/5,
F.R. Germany (Telex: 01/83 653
FERAK)

Fermentaciones Synthesis S.A.
Carlzada de Talpan 3015,
Mexico 22 DF.,
Ave. Union 1528,
Monterrey NL,
Edo de Mexico,
Mexico.

Fermic S.A. de CA.,
Calle Reforma No. 300,
Istapalapa,
Mexico 13 DF,
Mexico

Fermion OY,
P.O. Box 28,
02101 Tapiola,
Finland (Tel: 423122)
(Telex: 121818)

Flavine International Inc.,
248 Pegasus Ave., North Vale,
NJ 07647,
U.S.A. (Tel: 768-4190)
(Telex: 135153 Flavine)

Fluka AG Chemische Fabrik 9470,
Buchs,
Switzerland (Telex: 74282)

Gerad Ramon CIA.,
Cangallo, 2683,
1040 Buenos Aires,
Argentiana.

Gist Brocade.
P.O. Box I,
2600 M.A. Delft,
The Netherland (Tel: 015-792-256)
(Telex: 38031)

Giusto Faravilli,
via Medardo Rosso 8,
20159,
Milan,
Italy.

Givandam Sarl.,
44, Bd. Pu,
Parc Neuilly
Ourseien 92521,
France.

Glaxo 'oldin; Ltd.,
6-12 Clarges Street,
London W1,
United Kingdom.

Gramor Chemicals Co.,
43, US, HWY,
46 Pine Brook,
NJ 07058,
USA (Tel: 575-7820)
(Telex: 138756)

Grasser Salicylate,
Sandyford,
Deeside,
Clwyd,
CH5 2PX,
United Kingdom (Tel: 531777)
(Telex: 61128)

Greencross Corporation,
729 Seocho dong,
Kang Nam Du,
Seoul 134,
South Korea.

Greef R.W.
1445E Putnam Ave.,
Old Greenwich,
CT 06870,
USA (Tel: 203-637-437)
(Telex: 996609 RW Greef)

Great Lakes Chemicals,
P.O. Box 2200,
West Lafayette,
IN.,
U.S.A.

Grueneuthal umbh.,
Postfach 129,
D-5190,
Stolberg,
F.R. Germany (Tel: 02402)
(Telex: 832230)

GYMA Laboratorias,
65 Commercial Ave.,
Garden City,
NY 11530,
U.S.A. (Tel: 294-0900)
(Telex: 649249)

Hancock Remedies,
344 Sangbong Dong,
Dongdaemun Ku,
Seoul 130-01,
South Korea.

Hefti AG.,
P.O. Box 245 Hohlstrasse 507,
8048 Zurich,
Switzerland.

Heim and Lundin AS.,
Dronningensgate 10-12,
Oslo-1,
Norway.

Henley and Co.,
750, 3rd Ave.,
New York,
NY 100017,
U.S.A.

Helm New York Chemicals,
1110 Centennial Ave.,
Piscataway,
NJ 08854,
USA (Tel: 981-1160)
(Telex: 642303)

Hetako Chemical Works,
P.O. Box 15,
1902 Evronnaz,
Switzerland.

Hilton Davis Chemicals,
Fawdon New castle Upon Tyne,
NE3 3TT,
United Kingdom.

Hickson and Welsh,
Castleford WF 10,
United Kingdom

Hindustan Antibiotics Ltd.,
Pimpi,
Poora,
India

Hindustan Organic Chemicals,
Hari Chandra House,
81 M.K. Road,
Bombay,
India

Hoffman La Roche F Co AG.,
Grenzo Cherstrasse 124,
CH-4002,
Basle,
Switzerland (Tel: 061-250012)
(Telex: 62292)

Hoechst A.G.,
Postfach 800320,
D-6230,
Frankfurt/m 80,
F.R.Germany (Tel: 0611-3051)
(Telex: 041234 Hoeagd)

Hopkin and William
Freshwater Road,
Cladwell Heath,
Essex,
United Kingdom.

Howard Hall International,
223 Putnam Av. Cos Cob.,
CT 06807,
U.S.A.

Huhamaki Oy Leiras,
P.O. Box 415,
SF 20101,
Turku 10,
Finland (Tel: 09-14061)
(Telex: 12-532 YHTMA)

Hul Ltd.,
Cedars House,
Oprington,
Ken,
United Kingdom.

Hummel Chemicals,
P.O. Box 250,
10 Harwich Road,
S. Plainfield,
N.J. 07080,
U.S.A.

H Yun Dai Pharm Ind. Ltd.,
9-195 Sosa Dong Buchun Si,
Kyungki Do,
South Korea.

I.B.I. Spa.,
Via G. Lorenzini 2/4,
20139 Milano,
Italy (Tel: 02/5253)
(Telex: 320367 IBILOR)

ICC Industries,
720 Fifth Ave.,
New York 10019,
U.S.A.

ICC Industries,
Amsteldijk 166,
Amsterdam,
The Netherlands. (Tel: 448888)
(Telex: 14304)

ICI Ltd.,
(Imperial Chemical Industries)
Millbank,
London S.W.1,
United Kingdom (Tel: 834-4444)
(Telex: 21324)

ICI
P.O. Box 42,
Hexagon House,
Blackley,
Manchester,
United Kingdom.

ICIC Ltd.
40 Street Clair Ave.,
Suite 301,
Toronto,
ONT M4T 1M9,
Canada

ICFI SPA.,
Industria Chimiche Farmaceutische Italiana,
via Bertola da Novati 14,
20157 Milan,
Italy (Telex: 331541 Tosifa)

ICL S.p.a.
00156, via Tiburtina,
1040 Rome,
Italy (Tel: 06-436981)
(Telex: 61035 ICL)

ICN,
1956 Bourdon Street,
Montreal PQ H4M 1V1,
Canada.

Immuno A.G.,
Donnastrasse 1,
A-1012 Vienna,
Austria (Tel: 235545)
(Telex: 135545)

Immuno GmbH.,
Postfach 10 3080,
D-6900 Heidelberg 1,
F.R. Germany

Indian Drugs and Pharmaceuticals,
P.O. Box 3816,
New Delhi,
India.

Indian Process Chemicals,
Yeswan Papur Bangalore 22,
India.

Industria Quimica Andina,
Carrera 12,
15-95 Piso 10,
Bogot,
Columbia.

Inland Chemicals,
127W, Berry Street,
Commerce Building,
Forte Wayne,
U.S.A.

Invernildbaffa Vera,
via Rimpemont,
Milan,
Italy

Instituto Chemioterapico Italiano SpA.,
Casella Postale 1052,
20100 Milan,
Italy.

Institut Merieux,
17 rue Bourgelat,
F-69223,
Lyon I,
France

Instituto Biochemico Italiano,
Milan
Italy

Instituto Franco Tosi SpA.,
via Bertola da Novate 14,
20157 Milano,
Italy (Tel: (02) 308 7341)
(Telex: 331541 Tosifa)

Instel Ltd.,
Marching Division,
Millmead,
Staine,
Middlesex TW18 84LF
United Kingdom

Italsintex Srl.,
4 Galleria Contarini,
35100 Padova,
Italy

I.S.F. Spa.,
Via Leonardo da Vinci,
I-20090 Trezzano Sul Naviglio MI,
Italy (Tel: (02) 4453641)
(Telex: 321469 SF I)

Iwaki and Co.,
4-1 Nihoubashi Honcho,
Chuo-Ku,
Tokyo 103
Japan

Jayant Vitamins Ltd.,
133 Mahtama Gandhi Road,
Bombay 40000,
India

Joba Oxyde
Kantoorgebouw Rembrandt,
Biesbosch 225,
Posthus 578,
Amstelveen,
The Netherlands (Tel: 459966)
(Telex: 12351)

Janssen Pharmaceutica N.V.,
Aldrich Europe Div.,
B2340,
Beerse,
Belgium (Tel: 014 613031)
(Telex: 32540)

Julian De Mexico S.A. Laboratorios,
Calle 37-E Menz 4,
Lote 7,
Claudad Industrial de Cuernavaca,
Cuernavaca,
Morelos,
Mexico

Japan Hydrazine Co.,
1-1 Uchisaiwai-cho,
2 Chome,
Chiyoda Ka,
Tokyo - 100,
Japan

J and H Lowenstein and Sons,
420 Morgen Ave.,
Brooklyn NY 11222,
USA (Telex: 235082 Lowe)

J.T.Bakers,
222 Red School Lane,
Phillipburg,

Kabi A.B.,
S-11287 Stockholm,
Sweden

Kay Fries Chemicals,
60 Craig Road,
Montvale N.J. 07645,
USA

K and K Laboratories,
121 Express Street,
NY 11803,
Plainview,
USA

K and K Greef Chemicals,
Suffolk House,
George Street,
Croydon,
United Kingdom (Tel: 686-0544)
(Telex: 28386 KKG)

Kennedy and Kim
210 W. Front Street,
Red Bank,
NJ 07701, (Telex: 132403)
USA

Krka Pharmaceuticals and Chemical
Works,
61000 Ljubljana,
Yugoslavia.

Klockner and Co.,
Postfach 21,
4100 Duisberg-1-,
F.R. Germany

Laboratories Delagrang,
39 Blvd. de Latour-Maubourg,
F-75340,
Paris-7,
France

Laboratoris Grifols,
Jesus y Maria 6,
Barcelona 22,
Spain

Laboratorios Hubber,
Berlin 38,
Barcelona 29,
Spain

Laboratorios Almirall S.A.,
Cardoner 72-74,
Spain (Telex: 52659)

Laboratorios Mag,
Viale Gran Sasso 22,
20131 Milan,
Italy

Laboratoris MYN S.A.,
Av Coyoacan No. 1707,
Mexico D.F.,
Mexico.

Laboratoris Julian de Mexico,
Apartado Postal 14,
Cuernavaca,
Mor.,
Mexico

Lab CT S.R.L.,
Viale Dante Alighieri 49,
18038 Sanremo (IM),
Italy (Telex: 270620)

Lar Christenson;
35 Peter Bangs Vej,
DK-2000 Copenhagen;
Denmark

Lapex S.A.,
Av. Leandro H-884 3 AR,
Piso 1001,
Nuenos Aires,
Argentina

Lannacher Heilmittel,
8502 Lannach, STMK,
Austria (Telex: 031556)

Lepetite SA QI,
Av. Leandro H,
Alem 896,
1001 Buenos Aires,
Argentina

Leo Pharmaceutical Products,
55 Industriparken,
DK-2750,
Ballerup,
Denmark (Telex: 35147 LEO)

Louza Ltd.,
Munchenteinerstrasse 38,
4052 Basel,
Switzerland

Lupin Laboratories,
159 CST Road,
Kalina Scruz,
Bombay,
India

Lux Chemicals,
520 S El Camino,
Real Suite 600,
San Mateo,
USA (Telex: 235082 LOWE)

Mallinckrodt Inc.,
675 Mc Donell Blvd.,
P.O. Box 5840,
St. Louis,
MO 63134,
USA (Tel: (314) 895-2193)
(Telex: 447285)

Marsing and Co., A/S,
6 Sjaellansbroen,
DK-2450
Copenhagen,
Denmark (Tel: 4511 64444)
(Telex: 19925)

Marsing Div. Instel Corp.,
825 Third Ave.,
NY 10022,
New York,
USA (Tel: 758-5880)
(Telex: RCA 233182 ISCUR)

Mathews and Wilson,
Putney Bridge Road,
London,
United Kingdom.

May and Baker Ltd.,
Dagenham,
Essex,
United Kingdom (Tel: 592 3060)
(Telex: 28691)

Mars Chemicals,
Blvd. NW,
Atlanta ,
GA 30318,
USA

Marcel Quarre,
26 Pl,
St. Georges 75009,
Paris,
France

Maypro Industries,
521 5th Avenue,
New York,
USA

Mc Kesson Chemical Company,
One Post Street,
San Francisco,
California 94104,
USA

Merck E.,
Postfach 4119,
Frankfurtstrass 1,
250 D-6100,
Darmstadt,
F.R. Germany

Merck Chemical Division,
120E Lincoln Ave.,
Rahway,
NJ 07065,
USA

Merck Sharp Dhome,
West Point,
Pennsylvania,
USA

Medexport,
Kachovka 31/2,
Moscow 113461,
USSR

Medimpex,
P.O. Box 126,
H-1808 Budapest,
Hungary. (Tel: 183-955)
(Telex: 225477)

Meiji Seiko,
2-8 Kyrbashi,
2 Chome,
Chuo-Ku,
Tokyo,
Japan.

Miki Sangyo,
747 Third Ave.,
NY 10017,
New York,
USA

Mitchell Cot Chemicals,
P.O. Box 6,
Stamard Lane,
Marfield,
United Kingdom.

Mitsui Pharmaceuticals
2-5 Kasumiguseki Building,
P.O. Box 83,
325 Kasu migaseki,
Chiyoda Ku,
Tokyo-100,
Japan

Monsanto Ltd.,
800-N
Lindberg Building,
St. Louis,
USA (Tel: 44-7282)

Monsanto Ltd.,
10-18 Victoria Street,
London S.W. 14,
United Kingdom (Tel: 222-5678)
(Telex: 23259)

Morton Norwich,
110 N.
Wacker Drive,
Chicago,
Ill.,
USA (Telex: 254433)

Montedison SpA.,
Foro Buouaparte 31,
20120,
Milan,
Italy

Montedison GmbH.,
Frankfurterstrasse 33-35,
D-6236,
Echbarn/Frankfurt,
F.R. Germany

Montoil Sarl.,
103 rue Reaumur,
75002 Paris,
France (Tel: 2362041)
(Telex: 21007)

Mustafa Nevzet Medidiyoky,
Yeniyol,
Sok N018,
Istanbul,
Turkey.

Muenchen GmbH.,
Freisinger,
Landstrasse 74,
Postfach 101,
Munich,
F.R. Germany

MWM Chemicals,
527 Madison Ave.,
New York,
NY 10022,
USA (Telex: 420051)

National des Poudre et Explosif,
12 quai Henery IV,
Paris 4e,
France

Napp Chemicals Inc.,
199 Main Street,
Lodi NJ 07644,
USA (Tel: 773-3900)
(Telex: 134649 Napp)

Nepera Chemicals - Schering AG.,
Rt 17 Harriman
NY 10926,
USA

Nikko Chemicals Co. Ltd.,
4-8 Nichonbashi Bakuro Cho,
1 Chome Chuo-Ku,
Tokyo 103,
Japan

Nipa Labs GmbH. und Holstein,
Cremon 32,
Jastram,
Hans 2000,
Hamburg 11,
F.R.Germany

Nippon Kayaku Co.,
New Kaijo Building 2-1 ,
Marunochi,
1 Chome,
Chiyoda KU,
Tokyo 100,
Japan (Telex: 26422)

Nordisk Insulinlaboratorium,
2 Ved Stadion DK-2820,
Gentefte,
Copenhagen,
Denmark.

Novo Laboratories,
Ringwayhouse,
Bell Road,
Basingstoke,
Hants,
United Kingdom

Novo Industries A/S,
DK-2880 Bagsvaerd,
Denmark. (Telex: 27116)

OY Rohjo AB.,
P.O. Box 35
SF 10601 Tummisaari,
Finland

Organon N.V.,
PB-20,
Kloosterstraat 6,
OSS(NB)
The Netherlands (Telex: Org 50294)

Orsase S.A.,
Eje Norte Sury,
Cuerravaca,
Moreios,
Mexico

Opas Sri.,
Via Monte Rosa 116,
20089 Valleambrosia di Rozzano,
Milan,
Italy (Tel: 825 0478)

Oxyde Joba,
Postbus 7886,
1008 AB,
Amsterdam,
The Netherlands (Tel: 020-448877)
(Telex: 11410)

Orion Pharmaceutica,
P.O. Box 19,
SF-00101,
Helsinki 10,
Finland (Tel: 90-71-7411)
(Telex: 12721)

Orgamol,
Fabrication de Produits Chimiques,
CH-1902 Evionnaz,
Switzerland (Telex: 38153)

Organon Inc.,
375 Mt. Pleasant Ave.
West ORange,
NJ 07052,
USA (Telex: 136307)

Orlex Chemicals Corp.,
39-40 Route 4,
Fairlawn,
NJ 07410,
USA (Telex: 130429 Orlex)

Orsabe S.A.
Eje Nortese 13,
Industrial del Valle de,
Cuernavaca,
Moreios,
Mexico.

Otsuka Chemicals,
10 Bungo Machi,
Higashi Ku,
Osaka,
Japan.

Pacific Gateway,
Alcoa Building,
One Maritime Plaza,
San Francisco,
USA (Telex 910 3728415)

Pan Britanica Industries,
Waltham Cross
EN8 7DY
United Kingdom

Park Davis,
P.O. Box 118,
G.P.O. Detroit,
MI 48232,
USA

Park Davis,
188 Howard Ave.,
Holland MI,
USA

Pharmchem Labs,
130 Welsley Street,
S Hackensack,
NJ 07606,
USA

Pharmachem,
16 Iliensko Chansee,
Sofia,
Bulgaria

Penickcorp,
1050 Wall Street,
Lyndhurst,
NJ 07071,
USA

Pfanstiehl Laboratories,
1219 Glen Rock Ave.,
Wankegen Ill,
USA (Telex: 253672)

Pfizer International Inc.,
235 East,
42nd Street,
New York 10017,
USA

Philipps Duphar N.V.,
P.B. 7006,
Apollolaan 151,
Amsterdam,
The Netherlands

Pierrel Spa,
via Comelico 39/41,
20135 Milan,
Italy (Tel: 02/57901)
(Telex: 310015 Pierrel)

Pliva Pharmaceuticals,
41001,
Zagreb Il.,
Yugoslavia.

Priti Chemicals,
86 Bajaj Bhawan,
Nair Man Point,
Bombay 400021,
India

Polfa,
Ulica,
Wspolna no. 4,
Warsaw,
Poland

Pioneer Salts and Chemicals,
940 N. Delaware Ave.,
Philadelphia,
USA

Products Pyne,
Daniel Mangrane,
Apartado 224,
Barcelona,
Spain

Product Chimiques B.P.,
175-16
75782 Paris,
Cedex 16,
France

Producta Geueral de Perfumaria,
Benito Putierrex 10,
Tutor,
Madrid 18,
Spain (Tel: 2439510)
(Telex: 27307 Com E)

Productos Quimicos Finos S.A.
Av. Jnarez no. 134-2-piso,
Mexico IDF

Proter,
via Lambro 38,
20090 Opera Milan,
Italy (Telex: 321632 Proter)

PPG Chemicals,
Gateway Centre,
Pittsburg
PA 1522,
USA

Quinonas de Mexico,
Zinc no. 58,
Fraco Esfuerzo Nacincnal,
Xelostos Edo. de Mexico,
Mexico

Quimica Pharmaceutica Platense,
Jos Barros Pazo 5531,
1439 Buenos Aires,
Argentina

Quimica Industrial Santo Amaro,
Rua Ijuatinga 337,
04744 Sao Paulo,
Brazil

Quimica Lorenzeni S.A.
Av. Casa Granda 2.021,
Piraporinha,
09900,
Diadema,
Sao Paulo,
Brazil

Quimica Siul S.A.
Kennedy Onelli,
1644 Victoria,
Artgentina

Quimio Product Quimico,
Rha de Rooha 155,
20960,
Rio de Janero,
Brazil

Rachelle Labs.,
P.O. Box 2029,
Long Beach,
CA 90801,
USA

Ravank ex Monscadet,
14 Av. Albert Einistein
93155 La Blaca,
Mesnil,
France

Ravit Spa.,
Casella Postale 12084,
00100 Roma,
Italy

Rhone Poulenc Chemical
P.O. Box 125,
Mammoth Junction,
NJ 08852,
USA

Rhone Poulenc
22 Ave. Montaigne F 75 360
Paris 8
France (Tel: 2564000)
(Telex: Rhodia Paris 28166)

Rexolin Chemicals,
Box 622,
S-25106 Helsingborg,
Sweden (Tel: 042/261460)
(Telex: 72353)

Riedel de Haen,
P.O. Box 1180,
Seezle,
F.R. Germany

Roland S.A.
Rue de la Petite lie 4,
Brussels,
Belgium (Tel: 02/5234000)
(Telex: RFBRUX 22827)

R.P. Chemicals,
G.P.O. Box 4066,
San Juan PR00936,
USA

Roussel Uclaf,
Tour Roussel Noble,
92080 Paris La Defense,
Cedex 3,
France

Roussel Corp.,
155E,
44th Street,
New York NY 10017,
USA

R.W. Unwin,
Prospect Palace,
Welwyn,
Herts,
United Kingdom (Telex: 24903)

R.W. Greef and Co.,
1445 E. Putnam Ave.,
Old Greenwich,
CT 06870,
USA (Telex: 996609 RWG)

Roche Products,
15 Manchester Square,
London W1,
United Kingdom (Telex 23112)

Ricken Vitamin,
Miyagikaikan Building,
2-9 Nishikanda,
Chiyoda-ku,
Japan

Raptokos Brett Co. Worli,
Bombay,
India

R.S.A. Corporation,
690, Sawmill River Road,
Ardsley,
NY 10502,
USA

Reilly Tar and Chemicals,
Market Square Building,
15IN Delaware St.,
Suite 1510,
Indianapolis,
USA (Telex: 274071)

San Quisan GmbH.,
Estermannngasse 17,
Linz,
Austria.

Salicilato de Mexico S.A.
Av. Oriente 171 N 435,
Colonia Argon Mexico 14DF,
Mexico

Salsburg Laboratories,
Charles City,
Iowa 50616,
USA (Tel 515257 2506)

Sanofi,
39 Ave., Pierrelar de Serbie,
F-75008 Paris,
France

Saneeta Laboratories
Industrial Estate Pologround,
Indore,
India

Sarabhi Chemicals,
Gorwa Road,
Broda 390007,
Gujrat P.O. Box 80,
Broda,
India

Sanquisan Medizinal GmbH,,
Estermannstrasse no. 17,
A-4020 Linz,
Austria

Sinquisa,
Lima, Peru

Scharper Care EMA.,
745 Fifth Avenue,
Suite 403,
New York,
NY 10051,
USA (Telex: 126421)

Schweiz-Serum Bern,
Postfach 2707,
CH-3001,
Bern,
Switzerland

Schhardt Theodor Dr.,
Postfact 801549,
8000 Munich 80,
F.R. Germany

Schering A.G.
Postfach 650,
D-1000
Berlin 65,
F.R. Germany (Tel: (030) 4681-1)
(Telex: 181777 a Schbd)

Shell Chemicals,
Shell Plaza,
Houston,
USA

Sigma Tan Spa.,
Via Pontina Km,
30400,
Pometzia Roma,
Italy (Tel: 912-1851)
(Telex: 612213 Sigma)

Schilling B.H.,
Via Fantoli 21/15,
Milan,
Italy (Telex 31554 BHS MI)

Secifarma Spa.,
Via GB,
Grass 197,
20157 Milan,
Italy (Telex: 315230)

Searle Chemical,
P.O. Box 8526,
Chicago,
Ill. 60680,
USA

Sero
Triesterstrasse 50,
A-1100 Wien,
Austria (Telex: 01-33404)

S.E.I.A.,
59 rue la Boetie,
Paris 75008,
France

Signa S.A.
Miguel A,
Quevedo no. 8,
Despachos 509 Y,
Mexico 20,
DF Mexico

Siemgluss,
2000 Hamburg I,
P.O. 105624,
F.R. Germany

Sherman Chemicals,
Sander Road,
Sandy Bedfordshire,
United Kingdom

Shinpoong Pharmaceuticals,
115-18 Myunmok 1 Doug,
Dongdaemun,
Ku,
Seoul 130-01,
S. Korea

Sobio Laboratories,
15 Bd., Admiral Bouis,
F-75782 Paris,
France

Societe Chimique Pointet Girad,
35 Ave. Jean Jaures,
F-92390,
Villeneuve Al.
Garenne,
France

Societe d'Equipment
Industrial Elex.,
25 Blvd. Amiral,
Bruix,
Paris 16e,
France

Societe Bristol Meyer,
17-19 Ave.,
Montagne,
F-75008 Paris,
France

Sociedad Mexicana de Quima,
Industria Tecoyotitla 412,
Mexico 20 DF,
Mexico

Sojuzchimexport,
Moscow G-200,
Sonolenskaja,
Sennaja, 32-34,
USSR (Telex: 124)

Streetley Corporation,
Berg House,
P.O. Box 56,
Basing View,
Basingstoke,
Hampshire,
United Kingdom (Tel: 0256-29292)
(Telex: 858371)

Stinnes Chemicals,
750 Third Ave.,
New York,
NY 10017,
USA

Spofa,
Husinecka,
11a Prague,
Czechoslovakia.

STIP Lab,
Chimico Biologico,
Lungarno Gambacorti 55-56100,
Pisa,
Italy (Telex: 050-28228)

Synbiotik S.a.
Flavio Zavala No. 7,
Letra D
Puente de Vigas,
Carr-a-Tlalnepantla,
EDO.D.E.,
Mexico

Synbiotics Ltd.,
P.O. Box 139,
Wadi,
Baroda,
India

Sydney Ross,
Rio Branco 251,
Andar Caira Postal 1363,
Rio de Janeiro,
Brazil

Syntex S.A.
Carrda de Besares no.9,
6 Carr Mexico,
Toluoa no. 2822,
Kilometer 13.5,
Mexico DF,
Mexico

Syntetic A/S,
53 Jen Baggesen Vej,
DK-8200, Arhus,
Denmark

Strang Chemicals,
3-4 West head Chamber,
George Street,
Staines,
Middlesex,
United States (Telex: 934931)

Sterling Drug Inc.,
90 Park Ave.,
New York
NY 10016,
USA (Tel: 972-2632)
(Telex: 420512)

Sterling Organics,
Dudley Northumberland,
NE23 7QG,
United Kingdom

Squibb Sons,
P.O. Box 4000,
Princeton,
New Jersey,
USA

Sumitomo Chemicals Co.,
New Sumitomo Building,
15 Kitahama,
5 Chome Higashi Ku,
Osaka 541,
Japan (Telex: 63823 SUMIKA)

Sudamfos S.A.,
Ave. Trabajo 5251,
1439, Buenos Aires,
Argentina

Swiss Explosive Works,
CH-5605 Dotikon,
Switzerland (Telex: 52694)

Sree Krishna Pharmaceuticals,
C-4 Industrial Area,
Uppal,
Hyderabad 500039,
India

SST Corporation 1373,
Broad Street,
Clifton
NJ 07013,
USA (Tel: 473-4300)
(Telex: 129267)

T.R. International,
134 Borough High street,
London SE1,
United Kingdom

Texaco Chemicals,
P.O. Box
Bellaire,
USA (Telex: 77401)

Takeda Chemicals Industries,
2-27 Doshomachin Highshiky,
Osaka 541,
Japan

Themis Chemicals,
69 GIDC Industrial Estate Vapi,
India.

Toyo Hydrazine Industry Co.,
Ginza Fuji Building,
7-10 Ginza Chuoku,
Tokyo 104,
Japan.

Tokyo Tanabe Co.,
2-7-3 Nihonbashi Hon-Cho-2 Chome,
Chuo-ku,
Tokyo 103,
Japan

Thomason and Joseph,
Castle House,
Castle Meadow,
Norwich,
United Kingdom.

Troponwerk GmbH.,
Postfach 801060,
D-5000,
Koeln 80,
F.R. Germany

Tanabe,
P.O. Box 85132,
San Diego,
California,
CA 92138,
USA

Theodor Scherdardt Dr. and Co.,
Postfach 801549,
8000 Munich 80,
F.R. Germany

UCB, Chemical Sector,
Chanssee de Charleroi-4,
B-1060,
Brussels,
Belgium

Unipex,
30 rue du FOrt BP,
150, 92504,
Rueil Malmaison,
Cedex,
Paris,
France (Tel: 749 5002)
(Telex: 204578 F)

Univar Chemicals
P.O. Box 5932,
San Mateo,
California 94403
USA.

Universal Preservechem Inc.,
Box 338 Roosevelt,
NJ 08555,
USA (Tel: 443-4545)
(Telex: 83302)

Union Carbide Ltd.,
8, Grafton Street,
London W1,
United Kingdom

Unwin R.W.,
Prospect Place,
Welwyn,
Herts,
United Kingdom.

Upjohn Co.,
Kalamzoo,
Michigan 49001,
USA (Tel: 323-5844)
(Telex: 224-401)

Union Carbide,
Old Ridgebury Road,
Danbury,
CT 06817,
USA

Union Fine Chemicals,
2-3 Shingil Dong,
Youngdengpoku,
Seoul,
S. Korea.

Uzina de Medicamente,
C/O Chimmiportexport Blvd.,
Ruplieii no.10,
Sector 4,
Bucharest,
Rumania.

United Mineral Chemicals,
129 Hunson Street,
New York,
NY 10013,
USA (Telex: 232685 UMCUR)

Vecchi and Piam S.A.S.,
via Padre G. Semeria 5-16131,
Geneva,
Italy (Tel: 010/360641)

Versaillaise de Produits Chimiques,
34 Champ Elysees,
Paris 8,
France (Tel: 3594723)
(Telex: 6400614 F)

Vicker Laboratories,
Greenholm Industrial Estate,
Barley in Wharfdale,
Ikley LS29,
United Kingdom.

Vitamins Inc.,
200E Randolph Drive,
Chicago,
IL 60601,
USA

Ward Blenkshop,
Fulton House,
Empire WQay,
Wembley,
Middlesex,
United Kingdom (Tel: 902-8686)
(Telex: 21265)

Weddel Pharmaceuticals,
Red Willow Road,
Wrexham Industrial Estate,
CLwyd LL139 PX,
United Kingdom. (Telex: 61507)

Western Chemicals,
11312 Hartland Street,
North Hollywood,
USA.

Wacker Chemie,
Postfach Primzregenstrasse 22,
8000 Munchen 22,
F.R.Germany

Wall Chemical's,
P.O. Box 583,
Westfield,
NJ 07090,
USA (Telex: 131451)

Wander GmbH.,
Donaustradstrasse 45,
A-1221 Vienna,
Austria

Wander Chemie A.G.,
via Serfino Babstra,
CH-6608,
Locarno,
Switzerland. (Tel: 093-75031)
(Telex: 79319)

Wasug Chemi Werk Aschen Gesellschaft,
D-8261 Aschan B,
Kraiburg,
F.R. Germany

Whitecourt Ltd.,
832 High Road,
London N12 9RA,
United Kingdom

Wilshire Chemicals Co.,
15324 S-Broadway,
Gardena,
CA 90248,
USA

Wyeth Laboratories,
P.O. Box 8299,
Philadelphia,
USA

Wynmounth LEhr Ltd.,
158 City Road,
London EC4 20A,
United Kingdom

Yu Yu Industrial Co.,
148 Ahnkuk-dong,
Chongro-ku,
Seoul 110,
S. Korea.

Yang Pharma,
4-182 Kakal Ra,
Kihung Myun,
Yongin Kun,
Kyungki - DO,
S. Korea.

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DIRECTORY OF SOURCES OF SUPPLY OF 26 ESSENTIAL BULK DRUGS, THEIR
CHEMICAL INTERMEDIATES AND SOME RAW MATERIALS

Addendum *

Impact of the prices of intermediates on the
cost of production of essential bulk drugs

Prepared by
the UNIDO secretariat

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INTRODUCTION

1. The method illustrated in this document has been appended to the Directory of Sources of Supply for Essential Bulk Drugs, with the aim of assisting industrial managers in the developing countries to apply a mathematical approach in arriving at indicative prices for intermediates used in the local manufacture of Essential Bulk Drugs.
2. The method can also be used to compare certain technical and economical aspects of alternative technologies.

CHEMICAL INPUT COST AND UNIT MARGINAL
DIFFERENCE ANALYSIS FOR CHEMICAL PROCESSES
USED IN THE PRODUCTION OF PHARMACEUTICAL BULK SUBSTANCES
AN ENGINEERING APPROACH

Based on a UNIDO study^{1/}, intermediates and raw materials account for 61 to 96 per cent of the variable costs in the production of bulk pharmaceutical substances in developing countries.

The study concludes that it is cheaper to import certain essential drugs than to manufacture them from imported raw materials. Under such conditions, economically feasible new plants cannot be established in developing countries and existing production units should be either closed down or operated under government protection.

The method described here is intended to assist developing countries to analyse the impact of chemical input costs on the economic feasibility of the production of pharmaceutical bulk substances and to select essential drugs for local production through evaluation of the unit marginal difference values.

Symbols and Definitions

I_m chemical input

O_n chemical output

f_{mn} chemical conversion factor, i.e. the number of units of chemical input(s) required for the production of 1 unit of chemical output(s).

P_{I_m} unit price of a chemical input

P_{O_n} unit price of a chemical output

1/ The pricing and availability of intermediates and bulk drugs, UNIDO ID/WG.331/4, 26 September 1980, pp. 12-35

c_{0n} unit cost(s) of chemical input(s) required for the production of 1 unit of chemical output(s)

M_n unit marginal difference, i.e. the difference between the unit price(s) of chemical output(s) and the unit cost(s) of chemical input(s)

* actual value(s) at a given time

** desirable value(s) at the same time to indicate the limit beyond which the process becomes economically feasible.

Description of the Method

The generalized single-step chemical reaction can be described by the following equation:

$$a_1 I_1 + a_2 I_2 + \dots + a_m I_m = b_1 O_1 + b_2 O_2 + \dots + b_n O_n \quad (1)$$

where I_1, I_2, \dots, I_m are the chemical inputs (reactants), O_1, O_2, \dots, O_n are the chemical outputs (products) and a_1, a_2, \dots, a_m and b_1, b_2, \dots, b_n are coefficients indicating the number of moles of inputs and outputs, respectively. It should be noted that the number of inputs is not necessarily equal to the number of outputs, hence the index of the last terms are different on the two sides of the equation.

When there is a theoretical relation between a chemical input, I_m , and a chemical output, O_n , then the chemical conversion factor f_{mn} is described by the following formula:

$$f_{mn} = \frac{a_m}{b_n} \frac{\text{mol wt } I_m}{\text{mol wt } O_n} \quad (2)$$

If the process cannot be described by an equation because the input is not a chemically defined substance - e.g., the cracking of petroleum -, or various outputs with the same chemical formula - e.g. structural

isomers - are simultaneously obtained in a chemical synthesis, then the chemical conversion factor is derived from experimental measurements and it can be defined by the following formula:

$$f_{mn} = \frac{wtl_m}{wtl_n} \quad (3)$$

Neither the theoretical, nor the maximum empirical chemical conversion factors are achieved in industrial practice and attempts to reach it would not always give economically optimum results. The greater is the difference between the optimum and industrial values, the less efficient is the technology studied.

The following formulae relate the unit costs of chemical inputs and the unit marginal difference to the unit price of a selected chemical output O_j :

$$c_{0j} = \sum_{i=1}^m f_{ij} p_i I_i \quad (4)$$

$$M_{0j} = p_{0j} - c_{0j} \quad (5)$$

The actual values at a given time are obtained from the relationships:

$$c_{0j}^* = \sum_{i=1}^m f_{ij}^* p_i^* I_i \quad (6)$$

and

$$M_{0j}^* = p_{0j}^* - c_{0j}^* = p_{0j}^* - \sum_{i=1}^m f_{ij}^* p_i I_i \quad (7)$$

Analogously, the desirable values are:

$$C_{0j}^{**} = \sum_{i=1}^m f_{ij} p_i^{**} \quad (8)$$

and

$$M_{0j}^{**} = P_{0j}^* - C_{0j}^{**} = P_{0j}^* - \sum_{i=1}^m f_{ij} p_i^{**} \quad (9)$$

The desirable values should be based both on the long-term observation of actual prices and on efficient chemical conversion factors. Spot market prices might distort the result and inefficient technologies do not reflect the techno-economic component of the unit marginal difference.

The unit marginal difference is not a constant. Its value depends on the type of product (commodity, pseudo-commodity, speciality chemical, etc.) on the conditions of both production (technology, costing elements) and marketing (domestic and exports) and it changes also as a function of the time.

The differences between the actual and desirable values can be calculated:

$$c_{0j} = C_{0j}^{**} - C_{0j}^* \quad (10)$$

$$m_{0j} = M_{0j}^{**} - M_{0j}^* \quad (11)$$

and

If $C_{0j}^* < C_{0j}^{**}$, or $M_{0j}^* > M_{0j}^{**}$, then the production is economically feasible.

If this is not the case, then (a) the price of the chemical inputs can be negotiated within reasonable limits, (b) the chemical conversion factor can be improved, or (c) the price of the chemical output can be subsidized.

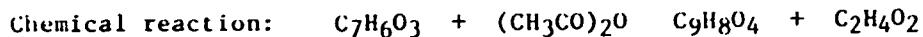
The desirable individual chemical input price can be calculated by using the following formula:

$$P_{I_i}^{**} = P_{I_i}^* - P_{I_i}^* \frac{\Delta M_0}{C_0} \frac{j}{j}$$
 (12)

and the obtained value can serve as a basis for negotiation of the intermediate price.

The chemical conversion factor can be compared to the theoretical and industrially optimum values - indicative figures are available from process patent descriptions - and the difference can justify a cost-related process development project.

Example



Common name of reactants and products:	salicylic acid	acetic anhydride	acetylsalicylic acid	acetic acid
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Symbols used in this analysis:	SA	AA	ASA	-
--------------------------------	----	----	-----	---

Molecular weight:	138.12	+ 102.09	= 180.16	+ 60.05
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Chemical conversion factors:	f_{SA}	f_{AA}	
- theoretical	0.767	0.567	1.000
- industrial	0.776 ^{2/}	0.574 ^{2/}	1.000

2/ Sittig, M.: Pharmaceutical Manufacturing Encyclopedia, Noyes Data Corporation, Park Ridge, New Jersey, U.S.A. pp. 39-40

Actual Values:

$$P_{SA}^* = \$ 1.53/1b^{3/4} = \$ 3.37/kg$$

$$P_{AA}^* = \$ 0.41/1b^{3/4} = \$ 0.90/kg$$

$$P_{ASA}^* = \$ 1.66/1b^{3/4} = \$ 3.36/kg$$

$$C_{SA}^* = f_{SA} \times P_{SA}^* = 0.776 \times \$ 3.37 = \$ 2.62$$

$$C_{AA}^* = f_{AA} \times P_{AA}^* = 0.574 \times \$ 0.90 = \$ 0.52$$

$$C_{ASA}^* = C_{SA}^* + C_{AA}^* = \$ 3.14$$

$$M_{ASA}^* = P_{ASA}^* - C_{ASA}^* = \$ 3.66 - \$ 3.14 = \$ 0.52$$

Desirable Values:

If the unit marginal difference in a developing country is, for example, \$1.46/kg of ASA, then:

$$\Delta M_{ASA} = \$1.46 - \$0.52 = \$ 0.94$$

$$P_{SA}^{**} = P_{SA}^* - \frac{\Delta M_{ASA}}{C_{ASA}^*} = 3.37 - 3.37 \times \frac{0.94}{3.14} = \$ 2.36/kg$$

and

$$P_{AA}^{**} = P_{AA}^* - \frac{\Delta M_{ASA}}{C_{ASA}^*} = 0.90 - 0.90 \times \frac{0.94}{3.14} = \$ 0.63/kg$$

