

1995

# BIOCHEMICALS

# ORGANIC COMPOUNDS

*for Research* AND

# DIAGNOSTIC REAGENTS

## TOLL FREE ORDERING

### Ordering Hours

Monday through Friday - 24 Hours a Day  
Saturday, Sunday and Holidays -  
6:00 a.m. to 5:00 p.m. (CST)

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Call Collect ..... **314-771-5750**

**Bulk Inquiries - Call SAF**  
*See Page 16 for Details*

### FAX

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*For TWX, TELEX, Cable or Collect FAX Calls... see page 3*

## CUSTOMER/TECHNICAL SERVICE

Customer Service/Technical Service telephone numbers located on card inside front cover and on page 3.

*Should you have any problems getting excellent service at the above numbers, please call COLLECT (anytime Day or Night, including Weekends and Holidays) 314-531-9500.*

# SIGMA

## CHEMICAL COMPANY

ALPHABETICAL LIST

BIOACTIVE PEPTIDES

IMMUNOCHEMICALS

MOLECULAR BIOLOGY

TISSUE CULTURE

OTHER PRODUCT GROUPS

EQUIPMENT BOOKS AND SUPPLIES

DIAGNOSTIC KITS AND REAGENTS

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## Service Is Available From Our Affiliates

### UNITED STATES

Sigma Chemical Company  
P.O. Box 14508  
St. Louis, Missouri 63178  
Toll-Free Tel: 800-325-3010  
Toll-Free Fax: 800-325-5052  
Tel: 314-771-5750  
Fax: 314-771-5757

### AUSTRALIA

Sigma-Aldrich Pty. Limited  
Unit 2, 10 Anella Ave.  
Castle Hill NSW 2154  
Free Tel: 008-800-097  
Free Fax: 008-800-096  
Sydney Tel: 899-9977  
Sydney Fax: 899-9742

### AUSTRIA

Sigma-Aldrich Handels GmbH  
Simmeringer Hauptstr. 24  
A-1110 Wien  
Tel: 0222/740 40 644  
Fax: 0222/740 40 643

### BELGIUM/THE NETHERLANDS

Sigma-Aldrich N.V./S.A.  
K. Cardijnplein 8  
B-2880 Bornem  
Free Tel: 0800 14747  
Free Fax: 0800 14745  
Tel: 03 8991301  
Fax: 03 8991311

### From the Netherlands

Free Tel: 06 0224748  
Free Fax: 06 0224745  
Tel: 00-32-3-8991301  
Fax: 00-32-3-8991311

### BRAZIL

Sigma-Aldrich Chemical  
Representacoes Ltda.  
Rua Sabará, 566 - Conj. 53  
01239-010 São Paulo, SP  
Tel: (011) 231 1866  
Fax: (011) 257 9079

### CZECH REPUBLIC

Sigma-Aldrich s.r.o.  
Křižíkova 27  
186 00 Praha 8  
Tel: 02/2422 5285  
Fax: 02/2422 4031

### FRANCE

Sigma-Aldrich Chimie S.a.r.l.  
L'Isle D'Abeau Chesnes  
B.P. 701,  
38297 St. Quentin Fallavier  
Cedex  
Tél. Numéro Vert: 05 21 14 08  
Fax Numéro Vert: 05 03 10 52  
Tél: 74 82 28 00  
Fax: 74 95 68 08

### GERMANY

Sigma-Aldrich Chemie GmbH  
Grünwalder Weg 30  
D-82041 Deisenhofen  
Free Tel: 0130 5155  
Free Fax: 0130 6490  
Tel: 089/6513-0  
Fax: 089/613 51 35

### HUNGARY

Sigma-Aldrich Kft  
1067 Budapest  
Teréz krt. 39.  
I. em. 11.  
Tel: (06-1) 269-1288  
Fax: (06-1) 153-3391

### INDIA

Sigma-Aldrich Corporation

#### New Delhi location

B-4/158 Safdarjung Enclave  
New Delhi - 110 029  
Tel: (11) 688 6872  
Fax: (11) 688 6873

#### Hyderabad location

Plot No. 70, Road No. 9.  
Jubilee Hills,  
Hyderabad 500 033  
Tel: (040) 244 739  
Fax: (040) 244 794

### ITALY

Sigma-Aldrich S.r.l.  
Via Gallarate 154  
20151 Milano  
Free Tel: 1678-27018  
Tel: (02) 33417-310  
Fax: (02) 38010737

### JAPAN

Sigma-Aldrich Japan K.K.  
JL-Landic Building  
Horidome Cho 1-10-15  
Nihonbashi Chuo-Ku  
Tokyo 103  
Toll-Free Tel: 0120-070406  
Toll-Free Fax: 0120-676788  
Tokyo Tel: (03) 3258 0155  
Tokyo Fax: (03) 5640 8855

### KOREA

Sigma-Aldrich Korea  
206 Samhan Camus Building  
17-3, Yoido-dong, Yungdeungpo-ku  
Seoul  
Toll-Free Tel: 080-023-7111  
Free Fax: 080-023-8111

### MEXICO

Sigma-Aldrich Quimica, S.A. de C.V.  
Avenida Picacho Ajusco No. 130-303  
Fraccionamiento Jardines en la Montana  
14210 Mexico, D.F.  
Free Tel: 91-800-00753  
Tel: (5) 631-3671 (In Mexico City)  
Fax: (5) 631-3780

### POLAND

Sigma-Aldrich Sp. z o.o.  
Bastionowa 19  
61-663 Poznan  
Poland  
Tel: (48-61) 232-481  
Fax: (48-61) 232-781

### SPAIN

Sigma-Aldrich Quimica S.A.  
Av. Valdelaparra 53  
28100 Alcobendas  
Madrid  
Free Tel: 900-101376  
Tel: 34-1-6619977  
Fax: 34-1-6619642

### SWEDEN

LabKemi  
Solkraftsvägen 14C  
S-135 70  
Stockholm  
Tel: 08-742 02 50  
Fax: 08-742 72 99

### SWITZERLAND

Sigma Chemie  
Postfach 260  
CH-9470 Buchs  
Free Tel: 155 00 20  
Tel: 081 755 2721  
Fax: 081 756 7420

### UNITED KINGDOM

Sigma-Aldrich Company Ltd.  
Fancy Road, Poole,  
Dorset, BH17 7NH  
Free Tel: 0800 373731  
Free Fax: 0800 378785  
Tel: 01202 733114  
Fax: 01202 715460

**ORDERING INFORMATION**

**To Place  
an Order  
Toll Free**

**Telephone**

USA/Canada . . . . . **800-325-3010**  
Outside USA/Canada (Call Collect) . . . . . 314-771-5750

**FAX**

USA/Canada . . . . . **800-325-5052**  
Outside USA/Canada . . . . . 314-771-5757  
For collect FAX calls outside USA/Canada  
call "Collect" and ask for the FAX machine . . . . . 314-771-5750

**TWX or TELEX** **910-761-0593 or 434475**  
Answerback "SIG OK COLLECT"

Our cable address is . . . . . SIGMACHEM

**Customer/  
Technical  
Service**

**Customer Service**

USA/Canada . . . . . **800-325-8070**  
Outside USA/Canada (Call Collect) . . . . . 314-771-5765

**Technical Service**

USA/Canada . . . . . **800-325-5832**  
Outside USA/Canada (Call Collect) . . . . . 314-771-5765

**Diagnostics Technical Service**

USA/Canada . . . . . **800-325-0250**  
Outside USA/Canada (Call Collect) . . . . . 314-771-3122

Should you have any problem getting excellent service at any of the above numbers,  
please call "COLLECT" (anytime Day or Night, including Weekends and Holidays)  
314-531-9500.

## Return Privileges and Policies

**Sigma** is certainly unique with regard to policies of cooperation, whereby we will do almost anything to help you with your problems, but one matter in which we are rather stubborn is the acceptance of returns. Policies have been developed through the years which we feel are extremely fair and cover almost every conceivable situation. To avoid future misunderstandings, we have outlined these policies here:

**Any reagent offered by Sigma is unconditionally guaranteed to be "satisfactory" to you.** Any reagent that does not perform as it should when you use it may be replaced without charge and transportation charges paid anywhere in the world. If you have any problem using one of our reagents and feel that a personal conversation would be helpful, please telephone the Customer Service Department collect. We want you to tell us when you find something wrong, and we ask for an opportunity to replace the materials. However, government directives that require expiration dating before deterioration occurs, make it impossible for us to replace such items after the expiration date has been reached. We do ask that you advise us of your problem before making the return. Please telephone the Customer Service Department collect for return shipping instructions and a Returned Materials Number to identify an authorized return. Unauthorized returns will not be accepted.

**Any reagent which we ship to you because of an error on our part is, of course, immediately returnable for replacement.** Should this happen, not only the replacement but our sincere apologies for the inconvenience we have caused you will go with the shipment. Sometimes purchase orders are received which are not clear: A stock number is given together with an item description, and they do not jibe. Such orders must be carefully scrutinized and compared with the customer's history in order to make a decision — to ship or not to ship — without delaying your work. If we write to you for clarification, you may be irritated with the delay. If we ship without writing to you first, we are similarly risking your ire. Then when the inevitable return is made, we prefer to discard the reagents and charge it off to experience. Sometimes this is quite expensive to us, but you are entirely within your rights in sending it back. Here again, if time is of the essence, you may telephone us collect to bawl us out and ask that the correct item be shipped without further delay.

**Items that you receive because of your error are not returnable for credit.** We certainly want to be cooperative and pleasant in every way, but to accept returns because you are overstocked or have discontinued use of the reagent, or any of many other reasons would result in a tremendous loss to us unless we were to pass the expense on to other customers in some fashion. Although other dealers may accept the return of a sealed package and resell it to someone else, we feel this could seriously jeopardize the work of the next customer. Once an item has been out of our control, we do not think it is fair to ask another customer to accept it. We acknowledge that in most cases the reagents are still entirely up to standard in every way and no harm would be done. However, in a small percentage of cases, purity or activity of the reagent is seriously affected by the extra trip, or by improper storage at the other end, or even by contamination. It is impossible for us to detect all of these possibilities and we could not resell that item with complete confidence. Fortunately, the vast majority of our customers are aware of Sigma's meticulous attention to detail and understand that this policy is one of many that give them confidence in Sigma. Instead of resenting this policy, many letters come to us expressing appreciation for it. Occasionally, we encounter a particularly stubborn individual typified by the expression, "My mind is made up; don't confuse me with facts!" who refuses to listen to reason and is only concerned with the refund. Of course, this person would be the first to refuse a shipment of a reagent if told in advance that it was returned merchandise. When such an individual is encountered, we personally want to talk to the customer and do everything possible to work out an agreeable solution to the problem. We sincerely want our customers to feel that "It's a pleasure doing business with Sigma. You must be satisfied or there is no cost."

**Please inspect your packages upon receipt and inform us immediately of any damage.** Should a product be found damaged, please retain the original shipping carton, shipping documents and any documents that might indicate that the shipment was received in a damaged condition.

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***Thank You For Taking Time To Read About The Sigma Policy.  
We Are Sure That It Has Helped Us To Help You.***

## Domestic Shipping Information

will vary with the destination and weight of the shipment. Typical transportation charges for small items marked FOB Sigma start at \$15.00–25.00. Next-day service is available on request at additional charge. If transportation and handling charges are quoted or invoiced, they will include charges in addition to actual freight costs.

Diagnostic kits and reagents are shipped FOB Sigma.

Shipments to Alaska and Hawaii are covered by the notes on International Shipments below.

## International Shipping Information

**We pay normal transportation charges unless otherwise noted.**

We do not pay transportation charges on those items identified as **FOB Sigma** in our catalog. We also do not pay transportation charges if you request a special method of shipment which is different from our preferred shipping method. Transportation charges for products marked **FOB Sigma**

outside the contiguous USA; they are marked with a **◆** in catalog

**Products marked FOB Sigma** in the catalog indicate charges for domestic shipments only. All products shipped outside the contiguous USA are **FOB Sigma**. Hazardous items and items requiring shipping in ice incur additional charges. **These products usually ship via air freight outside the contiguous USA; they are marked with a ◆ in catalog**

**listings.** Whenever possible, we use consolidated air freight to minimize your shipping costs. Unfortunately, customs and other regulations prevent us from doing this in all countries.

We will continue to do everything possible to minimize your shipping costs, but **YOU ALSO CAN HELP US:**

- **Consolidate your orders for hazardous items** so that air freight costs can be spread over as many products as possible. Air carriers, truck lines, and shipping companies have minimum charges.
- **Authorize accumulation of hazardous chemicals.** We will ship when we have sufficient material to exceed the minimum charge.
- **Consolidate orders from different departments in your institution;** we can bill separately as you instruct.
- **Advise us of the best route for hazardous items which can only be shipped in cargo planes** (not passenger planes). Some countries no longer have air cargo services.
- **Products marked with a ◆ must ship via air freight.** Acknowledge air freight shipping on your order to avoid delay in processing the order. Hazardous materials cannot generally be included with wet or dry ice air freight shipments. If your order contains hazardous and dry or wet ice items, please acknowledge two separate air freight charges.
- **Ask your favorite dealer to stock these items for you.**

If you are aware of any better means of getting hazardous shipments to you, please advise us.

The foregoing information is correct as we understand the current regulations. However, there are numerous additional restrictions based upon toxicity, carcinogenicity and other possible factors that may affect our handling of this problem in the future.

**Approximate air freight costs for products marked with a ◆ are:**

Africa	\$350.00	Canada	\$ 75.00	Japan	\$185.00
Alaska	135.00	Europe	180.00	Mexico	110.00
Asia	240.00	Hawaii	115.00	New Zealand	225.00
Australia	310.00	India	280.00	South America	190.00

## Dry Ice/Wet Ice Shipping Information

**Recommended long-term storage** is indicated in product listings as follows:

 <b>Ultracold</b>	 <b>Deep Freeze</b>	 <b>Freezer</b>
 <b>Freezer</b>	 <b>Refrigerator</b>	 <b>Room Temperature</b>

Not all items requiring long-term cold storage need to be shipped in ice. Shipping conditions may differ from our recommended storage temperatures. We will ship under conditions that ensure the quality of the product. We try to estimate the amount of dry or wet ice needed, but we cannot predict time lost in Customs offices or en route. The customer is responsible for prompt Customs clearance. If you cannot ensure prompt Customs clearance, **be sure to order additional ice, and specify which airport** you prefer.

To help prevent delays in Customs, please include name and telephone or fax number of person to contact upon arrival.

## Use of Our Products

Sigma Research Reagents are furnished **FOR LABORATORY USE ONLY**.

This means our products:

- may be used in laboratory research and experiments,
- may **NOT** be used as **DRUGS**,
- may **NOT** be used as **COSMETICS**,
- may **NOT** be used as **AGRICULTURAL or PESTICIDAL PRODUCTS**,
- may **NOT** be used as **FOOD ADDITIVES, and**
- may **NOT** be used as **HOUSEHOLD CHEMICALS**.

SIGMA DIAGNOSTIC REAGENTS ARE FURNISHED **FOR IN VITRO DIAGNOSTIC USE**.

**EXPIRATION DATING** of "In Vitro Diagnostic Reagents" is now compulsory under U.S. Government regulations. This may result in the expiration of reagents that are satisfactory but illegal to use for In Vitro Diagnostic purposes on humans. Obviously we cannot be responsible for such losses. Do not over-stock! Government regulations also require us to use "Due Diligence" when processing orders to ensure that our reagents are not purchased for drug or other use. In order to avoid delays, we recommend that orders carry the statement: "FOR LABORATORY USE ONLY. NOT FOR DRUG, HOUSEHOLD OR OTHER USES." Orders from students and other individuals are also subject to rejection because of the possible hazards involved. We are unable to ship our reagents to individuals not affiliated with institutions or firms. Please place your order through the institution or firm with which you are affiliated.

**Food & Drug Use:** Inquiries for our products for food and/or drug use are invited and will be considered on an individual basis under Food and Drug Administration regulations. For additional information, ask for the Sigma F&D Division.

**Bulk Sales:** We will consider requests for sales of our products in bulk quantities. For additional information, ask for SAF Bulk Chemicals.

**All Orders From High Schools** must be submitted in writing and on an official school purchase order with a minimum of two authorizing signatures.

**PRICES** — Although we try to keep our prices the lowest in the world, non-profit research laboratories may be further aided per our Cooperative Allowance Policy when they have insufficient funds. Prices shown are in U.S. dollars. If you place your order by phone, we will confirm our current price with you at that time. Please call us for current prices if you require this information prior to placing your order. We guarantee our written computerized quotations for 30 days (domestic) and 90 days (foreign). When placing your order, please reference our quoted prices or our pro forma number.

**Price Increases** — Since we try to ship all orders within a few hours of receipt, shipment will be made promptly even if prices have been nominally increased (unless you tell us not to). However, if we feel that the increase is "significant" we will request permission before shipment.

**Price reductions** — will automatically apply to your invoice. We reserve the right to discontinue the offering of any item without notice.

## Toxicity and Hazards

Each product offered by Sigma is intended for use by qualified professionals who are familiar with their potential hazards and trained in good laboratory procedures.

Information pertaining to the potential hazards of our chemicals is provided on our labels and in our Material Safety Data Sheets.

Material Safety Data Sheets will be provided as required by OSHA's Hazard Communication Standard for products which are hazardous. They are computer-generated from our data base, thus incorporating the most up-to-date information. They are sent under separate cover to the attention of the Safety Director.

The absence of a warning must not be interpreted as an indication of safety. We must emphasize that information is not available on the possible hazards of many compounds.

## Controlled Substances

The listing of Controlled Substances and Forensic Products begins on page 1824 of this catalog. Due to the additional cost of special handling and processing required by the DEA, we will add a \$40.00 fee to each order in the USA and a \$60.00 fee to each order outside the USA, regardless of the number of items in the order.

## Warranties

Sigma warrants that its products conform to their descriptions in Sigma literature. Purchaser must determine the suitability of the product for its particular use. Should any fail for reason other than through misuse, at Sigma's option, Sigma will replace it free of charge or refund the purchase price.

***This warranty is exclusive and Sigma makes no other warranty, expressed or implied, including any implied warranty of merchantability or fitness for any particular purpose.*** Sigma shall not be liable for any incidental, consequential or contingent damages.

For more information about the terms and conditions of sale, you should review our invoices and packing slips. Any customer who does not already have one of our invoices or packing slips may obtain a copy of our terms and conditions by writing or calling our Customer Service Department.



# How to Use This Price List

The **Alphabetical List of Compounds** contains listings and cross-references for over 35,000 products. Product Groups follow the alphabetical section and contain specialty sections such as Bioactive Peptides, Immunochemicals, Molecular Biology Products, and Tissue Culture Media & Reagents, as well as several smaller specialty product groups. A complete list of these special groups may be found in the Table of Contents on pages 1-2.

The products in this price list are divided into various sections:

- Alphabetical List of Compounds
- Product Groups
- Techware Equipment
- Diagnostic Kits and Reagents

BELOW ARE FIVE LISTINGS WHICH ARE TYPICAL FORMATS FOR OUR PRODUCT LISTINGS

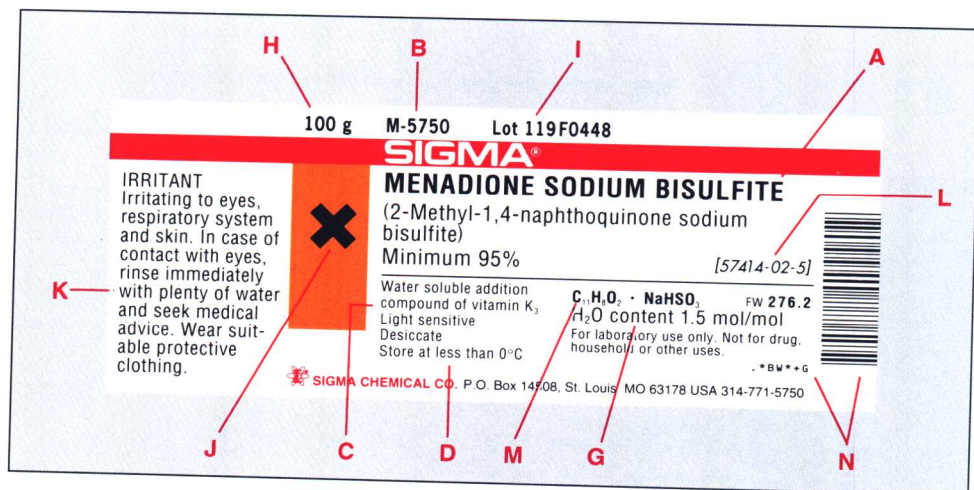
PRODUCT NUMBER		USA \$	PRODUCT NUMBER		USA \$
<b>H 3389</b> <b>HYPOXANTHINE-GUANINE PHOSPHORIBOSYL TRANSFERASE</b> (HGPRT; Transphosphoribosidase; IMP:pyrophosphate phosphoribosyltransferase; EC 2.4.2.8) From Bakers Yeast Lyophilized powder containing approx. 80% protein (Biuret) and 5% MgCl <sub>2</sub> ; balance primarily Tris buffer salts. Activity: 300-600 units per mg protein Unit definition: One unit will catalyze the formation of 1 nmole of guanosine 5'-monophosphate (IMP) per minute from guanine and phosphoribosyl pyrophosphate at pH 7.4 at 37°C. May be useful in the enzymatic determination of phosphoribosyl pyrophosphate (PRPP). Ref.: Salerno, C., et al., <i>Experientia</i> , 35, 1016 (1979) [9016-12-0]			250 units 18.50 1,000 units 59.30	<b>L-α-LYSOPHOSPHATIDYLCHOLINE</b> (L-α-Lysolecithin) [9008-30-4] C <sub>58</sub> H <sub>104</sub> NO <sub>8</sub> P FW 523.7	
<b>C 0523</b> <b>CHLOROMETHYLDIMETHYL-CHLOROSILANE</b> [1719-57-9] C <sub>2</sub> H <sub>5</sub> Cl <sub>2</sub> Si FW 143.1			25 g 28.30 100 g 87.60 FOB Sigma	<b>Type III: Approx. 99%</b> 5 mg 18.30 <b>From Bovine Liver</b> 25 mg 56.00 White Powder. 100 mg 178.50 Prepared by the action of phospholipase A on bovine liver L-α-phosphatidylcholine (P 7763). Contains primarily palmitic and stearic acids.	
<b>F 1395</b> <b>β-L-FUCOSE 1-PHOSPHATE</b> Synthetic [28553-11-9]				<b>Type V: Approx. 99%</b> 5 mg 15.10 <b>From Bovine Brain</b> 25 mg 47.30 Prepared by the action of phospholipase A on bovine brain L-α-phosphatidylcholine (P 6638). Contains primarily palmitic, stearic and oleic acids.	

- Product Name**
- Air symbol** - Product must be shipped via **Air Freight** outside the contiguous USA. This includes products that are classified as hazardous for shipping purposes or that require shipping with ice. See page 5 for additional information.
- Product Number**
- Storage Temperature** - Recommended storage is indicated below. Shipping conditions may differ from our recommended storage temperatures. Products are shipped under conditions which ensure product quality.  

-70°C	Ultracold	-5°C	Freezer
-20°C	Deep Freeze	0-5°C	Refrigerator
-20-0°C	Freezer	RT	Room Temperature
- New products** for this price list
- Enzyme Commission number**
- Source**
- Activity specification**
- Unit definition** for activity or absorbance units
- Technical reference** - literature on preparation, application or description of product.
- Chemical Abstracts Registry Number** (CAS Number)-CAS numbers vary in how specifically they define the material. Where a CAS number is provided for a mixture or solution, it is usually the CAS number of the solute or component named.
- Molecular formula and formula weight** - Unless water of hydration is indicated in the formula, the formula weight is for the anhydrous material.
- FOB Sigma** - see page 5 for complete explanation. Located in this position when applicable.
- Inquire** - For current status, please call for availability.
- Type** - convenient classification to distinguish various preparations.
- Other descriptive information**
- Heading** - Products with various salt forms, purities, sources, or preparations are listed with common information above the related group of compounds. In the example, the name, synonym, CAS number, formula, and formula weight for L-α-Lysophosphatidylcholine is common to both Type III and Type V (differ in source only).
- Short Line Rule** - Separates listings which share a common heading (see 17).
- Purity**
- Synonym(s)**
- Package Size(s) and Price(s)**



# Sigma Product Labels



## Pictograms

Pictograms are based on widely accepted standards.



**Explosive**



**Oxidizing**



**Flammable**



**Toxic**



**Harmful or Irritant**



**Corrosive**



**Biohazard**

## Sigma Product Labels

**Sigma's product labels** are designed to provide complete, up-to-date information on our products ... Information available when and where you need it most. On our labels, you can find:

- **Complete product name and description**
- **Health and safety hazard information**
- **Lot specific analytical data on many types of products**

**Our new label format** contains all the information you have always found, and adds:

- **Pictograms for instant hazard recognition**
- **Useful data for reference, CAS (Chemical Abstracts Service) number, chemical formula**

*Most of our products already have these new labels.*

## Key To Sigma Product Labels

### **A Product Name and Description**

### **B Product Number**

### **C Further Descriptive Information**

### **D Recommendations on Handling and Storage**

*Storage temperatures indicated are for long-term storage of products. Products may be shipped under different conditions to reduce shipping costs, while still ensuring product quality.*

### **E Hazard Statement**

### **F Anhydrous Molecular Weight**

### **G Lot Analysis**

*Data on activity, purity, degree of hydration, etc., for this lot.*

### **H Package Size**

*Unless the material is described as pre-weighed, the package will normally contain at least the indicated quantity, and usually somewhat more. For some products, the actual quantity at time of packaging is also shown. The user should always measure the amount needed from the container.*

### **I Lot Number**

### **J Hazard Pictogram**

*Lets you know at a glance what safety hazards are involved in the use of this product.*

### **K Further Hazard Information**

*More complete description of actual hazards, handling precautions, and emergency management procedures.*

### **L CAS Number**

*Chemical Abstract Service number shown wherever available. CAS numbers vary in how specifically they define the material. We make every effort to provide the most specific CAS number which applies. Where a CAS number is provided for a mixture or solution, it is usually the CAS number of the solute or component referred to in the main label name.*

### **M Chemical Formula and Formula Weight**

*Unless water of hydration is indicated in the formula, the formula weight is for the anhydrous material.*

### **N Bar Code and Eye Readable Equivalent**

*The bar code and the eye readable equivalent of the bar code are for Sigma internal use and label identification.*



Supporting  
the future  
with a tradition  
of service.



## Products

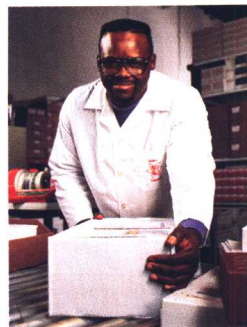
Sigma provides one of the world's largest sources of chemical and biochemical products for laboratory research use. This catalog provides convenient access to 35,000-plus products, of which over 2,000 are new items. Sigma's chemists are constantly at work on a wide spectrum of specialty chemicals for targeted areas of research, and they're continually refining and improving the products that established Sigma's reputation over 50 years ago.

## Quality

Every one of Sigma's products is thoroughly assayed in state-of-the-art analytical laboratories using the most demanding analytical criteria.

## Service

Sigma's goal is total customer satisfaction. Large inventories are maintained so all of Sigma's products are available when you need them. Every effort is made to ship your order the day it is received. Should technical questions arise, a Sigma specialist is available to assist you with the use or application of any one of our 35,000-plus products.



*Where Science and Service Come Together.*



## New Products

The Sigma catalog features over 2,000 new items. A complete listing of these new products begins on page 2409.

Sigma has expanded several product areas this year, including:

- **Growth Factors, Antibodies, and Cell Biology Reagents**
- **Electrophoresis Products**
- **Techware Laboratory Equipment and Supplies**
- **Protein Sequencing Reagents**

## SELECTED PRODUCT AREAS

**SIGMA**  
CELL CULTURE

Sigma Cell Culture is dedicated to the production and sale of tissue culture products for laboratory research and industrial use. These products are grouped together in the Tissue Culture section of this catalog for your convenience.

Our 150-plus new products include:

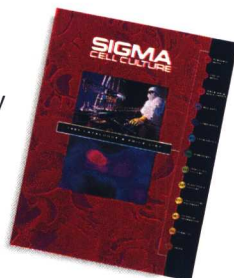
- **Chromosome Diagnostic Medium (CDM™)**
- **Serum-Free Medium Kits**
- **Charcoal-Stripped, Delipidated Calf Serum**
- **Gentamicin-Glutamine Solution**

Quality products are a hallmark of Sigma Cell Culture. Our production facilities comply with current Good Manufacturing Practices (cGMP) and our manufacturing facility in Scotland has achieved ISO 9002 registration.

With Sigma Cell Culture, you will continue to receive the highest quality products with the best service and support available.



See Pages 1495-1610



**SIGMA**

FORENSIC CHEMISTRY

Sigma Forensic Chemistry is committed to providing the highest level of service and the most complete product offering in this field. Each product in our continually expanding line of drug standards is thoroughly tested in our quality assurance laboratories, and includes a complete analytical data sheet to assist you with your analysis.

Our products include:

- **Controlled Substances and Deuterium Labelled Controlled Substances**
- **200-plus Drug Standards, Complete with Analytical Data Sheets**
- **Sigma Pseudo™ Scent Canine Training Aids**

The Forensic Chemistry group continues to develop solutions to problems for toxicologists, forensic chemists, crime labs, and pharmacologists.



See Pages 1824-1843





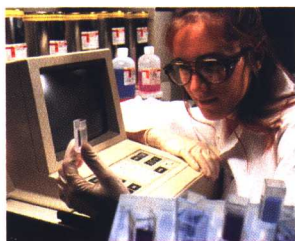
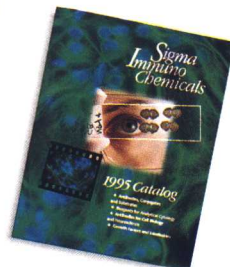
## *Sigma Immuno Chemicals*

Sigma Immunochemicals offers over 1,600 specialty immunochemical products for research use. Most of these products are prepared in our own production facilities. All our reagents are application-tested to ensure accurate and consistent results. Product data sheets accompany all of our products.

Several product lines have been introduced or expanded this year, including:

- **Over 50 New Growth Factors and Antibodies to Growth Factors**
- **Quantitative Flow Cytometry Kits**
- **Double-Labeled Antibodies to Human CD Markers**

Sigma Immunochemicals is continuously updating its product offering to meet your changing needs. Our manufacturing capabilities enable us to support custom and bulk customer needs.



**See Pages 1143-1408**

## **MOLECULAR SIGMA BIOLOGY**

Sigma Molecular Biology products undergo thorough application testing to ensure their performance. We continue to expand our product offering to meet your changing needs.

Recent additions to this product line include:

- **PCR Reagents**
- **Reagents and Kits for DNA and RNA Isolation**
- **Pre-Mixed Specialty Reagents**
- **In Vitro Transcription/Translation Reagents**

Our technical support group is staffed by highly trained molecular biologists who are available to discuss all your product needs and answer your application questions.



**See Pages 1409-1493**

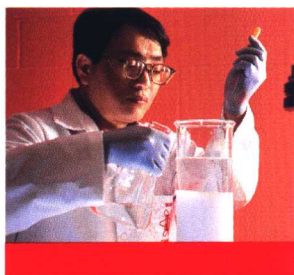
Sigma Peptides and Amino Acids is dedicated to the production and technical support of over 4,000 peptides, amino acid analogs, polyamino acids, protease substrates and peptide-related reagents for laboratory research use.

New products include:

- **Amyloid  $\beta$ -Protein Fragments, including Reverse Sequences**
- **Antimicrobial Peptides**
- **Peptide Neurotoxins**

For Bioactive Peptides, see page 1061; for Polyamino Acids, see page 1903; and for Protein Analysis Reagents, see page 1913.

The sequence to excellence begins with Sigma Peptides and Amino Acids.



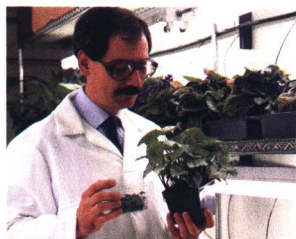
## SIGMA PLANT CULTURE

Sigma Plant Culture offers more than 400 products specifically developed, manufactured and tested for plant science research, plant tissue culture, plant pathology and phycology research.

This year we offer more than 70 new products including:

- **Virus Detection Kits**
- **Plant Growth Regulator Detection Kits**
- **Algae Culture Media**
- **Membrane Rafts and Sorbarod® Micropropagation Systems**

With Sigma Plant Culture, you can expect quality products, expert technical service and next day delivery. Our products are manufactured under current Good Manufacturing Practices (cGMP) and include complete physical, chemical and biological performance testing.



See Pages 1611-1639





## **SIGMA** **RADIOCHEMICALS**

You can rely on Sigma Radiochemicals to provide high quality  $^3\text{H}$  and  $^{14}\text{C}$  labeled products including:

- **Amino Acids**
- **Carbohydrates**
- **Nucleosides and Nucleotides**
- **Proteins**

We also carry out custom synthesis of  $^{14}\text{C}$  labeled compounds.

Sigma Radiochemicals provides the finest radiochemicals to laboratories throughout the world. Please refer to the Radiochemicals section in this catalog for details on our complete product line.

At Sigma Radiochemicals, nothing is more important than your results.



**See Pages 1921-1942**

## **SIGMA-ALDRICH** **Techware** FROM BENCHTOP TO BOOKSHELF

Techware is Sigma's product line of laboratory equipment and supplies. Techware offers the highest quality products because your research deserves the best.

New additions to the Techware line feature:

- **Kodak BioMax™ Autoradiography Film**
- **Eppendorf Microcentrifuges and Pipets**
- **Electrophoresis Units for Nucleic Acid Sequencing and Protein Separation**

From benchtop to bookshelf, you can depend on Techware as your source for quality laboratory products.



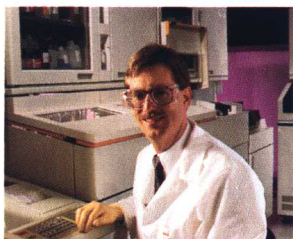
**See Pages 1957-2232**

**SIGMA  
DIAGNOSTICS**

Sigma Diagnostics is the one to count on for thousands of the highest quality products for every area of the clinical laboratory and nearly 3,000 reagent/analyzer applications.

Our TECH DIRECT<sup>SM</sup> HOTLINES connect you with experienced technologists and senior scientists who will trouble shoot on-site or by phone. They answer any question, any time from anywhere.

It's the Science of Service, that is the Sigma Diagnostics brand of laboratory medicine.



See Pages 2233-2407



SAF Bulk Chemicals offers large quantities of products from Sigma, Aldrich and Fluka Chemical Companies for manufacturing and commercial development. SAF is your single source of raw materials for a wide range of industrial applications.

SAF offers many benefits including:

- **50,000-plus Products**
- **Worldwide Production Facilities**
- **Complete Technical Support**
- **Custom Manufacturing and Packing**

All products are tested in-process and retested after production to ensure the highest quality.

Contact your SAF Bulk Chemicals office at **800-336-9719** or **314-771-5765** for more information.

