

correction. Each mL of 0.1 N tetrabutylammonium hydroxide is equivalent to 122.1 mg of benzoic acid.

$$N = \frac{\text{mg benzoic acid}}{122.1 \times \text{mL } (\text{C}_4\text{H}_9)_4\text{NOH}}$$

**Tetrabutylammonium Hydroxide in Methanol/  
Isopropyl Alcohol, 0.1 N**

Prepare as described for *Tetrabutylammonium Hydroxide, Tenth-Normal (0.1 N)* using isopropyl alcohol instead of toluene, and standardize as described. Alternatively, the solution may be prepared by diluting a suitable volume of commercially available tetrabutylammonium hydroxide solution in methanol with 4 volumes of anhydrous isopropyl alcohol.

$$N = \frac{\text{mg benzoic acid}}{122.1 \times \text{mL } (\text{C}_4\text{H}_9)_4\text{NOH}}$$

**Tetramethylammonium Bromide, Tenth-Molar (0.1 M)**

(CH<sub>3</sub>)<sub>4</sub>NBr, 154.05  
15.41 g in 1000 mL

Dissolve 15.41 g of tetramethylammonium bromide in water to make 1000 mL, and standardize the solution as follows.

Transfer an accurately measured volume of about 40 mL of the solution to a beaker, add 10 mL of diluted nitric acid and 50.0 mL of 0.1 N silver nitrate VS, and mix. Add 2 mL of ferric ammonium sulfate TS, and titrate the excess silver nitrate with 0.1 N ammonium thiocyanate VS.

$$M = \frac{\text{mL AgNO}_3 \times N \text{ AgNO}_3}{\text{mL } (\text{CH}_3)_4\text{NBr}}$$

**Tetramethylammonium Chloride, Tenth-Molar (0.1 M)**

(CH<sub>3</sub>)<sub>4</sub>NCl, 109.60  
10.96 g in 1000 mL

Dissolve 10.96 g of tetramethylammonium chloride in water to make 1000 mL, and standardize the solution as follows.

Transfer an accurately measured volume of about 40 mL of the solution to a flask, add 10 mL of diluted nitric acid and 50.0 mL of 0.1 N silver nitrate VS, and mix. Add 5 mL of nitrobenzene and 2 mL of ferric ammonium sulfate TS, shake, and titrate the excess silver nitrate with 0.1 N ammonium thiocyanate VS.

$$M = \frac{\text{mL AgNO}_3 \times N \text{ AgNO}_3}{\text{mL } (\text{CH}_3)_4\text{NCl}}$$

**Titanium Trichloride, Tenth-Normal (0.1 N)**

TiCl<sub>3</sub>, 154.23

15.42 g in 1000 mL

Add 75 mL of titanium trichloride solution (1 in 5) to 75 mL of hydrochloric acid, dilute to 1000 mL, and mix. Standardize the solution as follows, using the special titration apparatus described.

*Apparatus*—Store the titanium trichloride solution in the reservoir of a closed-system titration apparatus in an atmosphere of hydrogen.

Use a wide-mouth, 500-mL conical flask as the titration vessel, and connect it by means of a tight-fitting rubber stopper to the titration buret, an inlet tube for carbon dioxide, and an exit tube. Arrange for mechanical stirring. All joints must be air-tight. Arrange to have both the hydrogen and the carbon dioxide pass through wash bottles containing titanium trichloride solution (approximately 1 in 50) to remove any oxygen.

If the solution to be titrated is to be heated before or during titration, connect the titration flask with an upright reflux condenser through the rubber stopper.

*Standardization*—Place an accurately measured volume of about 40 mL of 0.1 N ferric ammonium sulfate VS in the titration flask, and pass in a rapid stream of carbon dioxide until all the air has been removed. Add the titanium trichloride solution from the buret until near the calculated endpoint (about 35 mL), then add through the outlet tube 5 mL of ammonium thiocyanate TS, and continue the titration until the solution is colorless.

$$N = \frac{\text{mL FeNH}_4(\text{SO}_4)_2 \times N \text{ FeNH}_4(\text{SO}_4)_2}{\text{mL TiCl}_3}$$

**Zinc Sulfate, Twentieth-Molar (0.05 M)**

ZnSO<sub>4</sub> · 7H<sub>2</sub>O, 287.56

14.4 g in 1000 mL

Dissolve 14.4 g of zinc sulfate in water to make 1 L. Standardize the solution as follows.

Accurately measure about 10 mL of 0.05 M edetate disodium VS into a 125-mL conical flask, and add, in the order given, 10 mL of acetic acid–ammonium acetate buffer TS, 50 mL of alcohol, and 2 mL of dithizone TS. Titrate with the zinc sulfate solution to a clear, rose-pink color.

$$M = \frac{\text{mL edetate disodium} \times M \text{ edetate disodium}}{\text{mL ZnSO}_4}$$

## Chromatographic Columns

The following list of packings (L), phases (G), and supports (S) is intended to be a convenient reference for the chromatographer. [NOTE—Particle sizes given in this listing are those generally provided. Where other, usually finer, sizes are required, the individual monograph specifies the desired particle size. Within any category of packings or phases listed below, there may be a wide range of columns available. Where it is necessary to define more specifically the chromatographic conditions, the individual monograph so indicates.]

### Packings

#### Change to read:

**L1**—Octadecyl silane chemically bonded to porous **▲**or nonporous **▲**USP35 silica or ceramic microparticles, 1.5 to 10 μm in diameter, or a monolithic silica rod.

**L2**—Octadecyl silane chemically bonded to silica gel of a controlled surface porosity that has been bonded to a solid spherical core, 30 to 50 μm in diameter.

**L3**—Porous silica particles, 1.5 to 10  $\mu\text{m}$  in diameter, or a monolithic silica rod.

**L4**—Silica gel of controlled surface porosity bonded to a solid spherical core, 30 to 50  $\mu\text{m}$  in diameter.

**L5**—Alumina of controlled surface porosity bonded to a solid spherical core, 30 to 50  $\mu\text{m}$  in diameter.

**L6**—Strong cation-exchange packing—sulfonated fluorocarbon polymer coated on a solid spherical core, 30 to 50  $\mu\text{m}$  in diameter.

**L7**—Octylsilane chemically bonded to totally porous silica particles, 1.5 to 10  $\mu\text{m}$  in diameter, or a monolithic silica rod.

**L8**—An essentially monomolecular layer of aminopropylsilane chemically bonded to totally porous silica gel support, 3 to 10  $\mu\text{m}$  in diameter.

**L9**—Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic cation-exchange coating, 3 to 10  $\mu\text{m}$  in diameter.

**L10**—Nitrile groups chemically bonded to porous silica particles, 3 to 10  $\mu\text{m}$  in diameter.

**L11**—Phenyl groups chemically bonded to porous silica particles, 1.5 to 10  $\mu\text{m}$  in diameter.

**L12**—A strong anion-exchange packing made by chemically bonding a quaternary amine to a solid silica spherical core, 30 to 50  $\mu\text{m}$  in diameter.

**L13**—Trimethylsilane chemically bonded to porous silica particles, 3 to 10  $\mu\text{m}$  in diameter.

**L14**—Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10  $\mu\text{m}$  in diameter.

**L15**—Hexylsilane chemically bonded to totally porous silica particles, 3 to 10  $\mu\text{m}$  in diameter.

**L16**—Dimethylsilane chemically bonded to porous silica particles, 5 to 10  $\mu\text{m}$  in diameter.

#### Change to read:

**L17**—Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form,  $\blacktriangle 6$  to 12  $\mu\text{m}$   $\blacktriangle_{\text{USP35}}$  in diameter.

**L18**—Amino and cyano groups chemically bonded to porous silica particles, 3 to 10  $\mu\text{m}$  in diameter.

**L19**—Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, about 9  $\mu\text{m}$  in diameter.

#### Change to read:

**L20**—Dihydroxypropane groups chemically bonded to porous silica  $\blacktriangle$  or hybrid  $\blacktriangle_{\text{USP35}}$  particles,  $\blacktriangle 1.5$  to 10  $\mu\text{m}$   $\blacktriangle_{\text{USP35}}$  in diameter.

**L21**—A rigid, spherical styrene-divinylbenzene copolymer 3 to 10  $\mu\text{m}$  in diameter.

**L22**—A cation-exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10  $\mu\text{m}$  in size.

#### Change to read:

**L23**—An anion-exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups,  $\blacktriangle 7$ –12  $\mu\text{m}$   $\blacktriangle_{\text{USP35}}$  in size.

**L24**—A semi-rigid hydrophilic gel consisting of vinyl polymers with numerous hydroxyl groups on the matrix surface, 32 to 63  $\mu\text{m}$  in diameter. [NOTE—Available as YMC-Pack PVA-SIL manufactured by YMC Co., Ltd. and distributed by Waters Corp. (www.waters.com).]

**L25**—Packing having the capacity to separate compounds with a molecular weight range from 100–5000 (as determined by polyethylene oxide), applied to neutral, anionic, and cationic water-soluble polymers. A polymethacrylate resin base, cross-linked with polyhydroxylated ether (surface contained some residual carboxyl functional groups) was found suitable.

**L26**—Butyl silane chemically bonded to totally porous silica particles, 1.5 to 10  $\mu\text{m}$  in diameter.

**L27**—Porous silica particles, 30 to 50  $\mu\text{m}$  in diameter.

**L28**—A multifunctional support, which consists of a high purity, 100 Å, spherical silica substrate that has been bonded with anionic exchanger, amine functionality in addition to a conventional reversed phase C8 functionality.

**L29**—Gamma alumina, reverse-phase, low carbon percentage by weight, alumina-based polybutadiene spherical particles, 5  $\mu\text{m}$  in diameter with a pore volume of 80 Å.

**L30**—Ethyl silane chemically bonded to totally porous silica particles, 3 to 10  $\mu\text{m}$  in diameter.

**L31**—A hydroxide-selective, strong anion-exchange resin—quaternary amine bonded on latex particles attached to a core of 8.5- $\mu\text{m}$  macroporous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene.

**L32**—A chiral ligand-exchange packing—L-proline copper complex covalently bonded to irregularly shaped silica particles, 5 to 10  $\mu\text{m}$  in diameter.

**L33**—Packing having the capacity to separate dextrans by molecular size over a range of 4,000 to 500,000 Da. It is spherical, silica-based, and processed to provide pH stability. [NOTE—Available as TSK-GEL G4000SWxl from Tosoh Bioscience (www.tosohbioscience.com).]

#### Change to read:

**L34**—Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form,  $\blacktriangle 7$  to 9  $\mu\text{m}$   $\blacktriangle_{\text{USP35}}$  in diameter.

**L35**—A zirconium-stabilized spherical silica packing with a hydrophilic (diol-type) molecular monolayer bonded phase having a pore size of 150 Å.

**L36**—A 3,5-dinitrobenzoyl derivative of L-phenylglycine covalently bonded to 5- $\mu\text{m}$  aminopropyl silica.

**L37**—Packing having the capacity to separate proteins by molecular size over a range of 2,000 to 40,000 Da. It is a polymethacrylate gel.

**L38**—A methacrylate-based size-exclusion packing for water-soluble samples.

**L39**—A hydrophilic polyhydroxymethacrylate gel of totally porous spherical resin.

**L40**—Cellulose tris-3,5-dimethylphenylcarbamate coated porous silica particles, 5 to 20  $\mu\text{m}$  in diameter.

**L41**—Immobilized  $\alpha_1$ -acid glycoprotein on spherical silica particles, 5  $\mu\text{m}$  in diameter.

**L42**—Octylsilane and octadecylsilane groups chemically bonded to porous silica particles, 5  $\mu\text{m}$  in diameter.

**L43**—Pentafluorophenyl groups chemically bonded to silica particles by a propyl spacer, 5 to 10  $\mu\text{m}$  in diameter.

**L44**—A multifunctional support, which consists of a high purity, 60 Å, spherical silica substrate that has been bonded with a cationic exchanger, sulfonic acid functionality in addition to a conventional reversed phase C8 functionality.

**L45**—Beta cyclodextrin bonded to porous silica particles, 5 to 10  $\mu\text{m}$  in diameter.

**L46**—Polystyrene/divinylbenzene substrate agglomerated with quaternary amine functionalized latex beads, about 9 to 11  $\mu\text{m}$  in diameter.

**L47**—High-capacity anion-exchange microporous substrate, fully functionalized with trimethylamine groups, 8  $\mu\text{m}$  in diameter. [NOTE—Available as CarboPac MA1 and distributed by Dionex Corp. (www.dionex.com).]

**L48**—Sulfonated, cross-linked polystyrene with an outer layer of submicron, porous, anion-exchange microbeads, 10 to 15  $\mu\text{m}$  in diameter.

**L49**—A reversed-phase packing made by coating a thin layer of polybutadiene onto spherical porous zirconia particles, 3 to 10  $\mu\text{m}$  in diameter. [NOTE—Available as Zirchrom PBD from www.zirchrom.com.]

**L50**—Multifunction resin with reversed-phase retention and strong anion-exchange functionalities. The resin consists of ethylvinylbenzene, 55% cross-linked with divinylbenzene

copolymer, 3 to 15  $\mu\text{m}$  in diameter, and a surface area not less than 350  $\text{m}^2$  per g. Substrate is coated with quaternary ammonium functionalized latex particles consisting of styrene cross-linked with divinylbenzene. [NOTE—Available as OmniPac PAX-500 and distributed by Dionex Corp. (www.dionex.com).]

**L51**—Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles, 5 to 10  $\mu\text{m}$  in diameter. [NOTE—Available as Chiralpak AD from Chiral Technologies, Inc., (www.chiraltech.com).]

**L52**—A strong cation-exchange resin made of porous silica with sulfopropyl groups, 5 to 10  $\mu\text{m}$  in diameter. [NOTE—Available as TSK-GEL IC-Cation-SW from Tosoh Bioscience (www.tosohbioscience.com).]

**L53**—Weak cation-exchange resin consisting of ethylvinylbenzene, 55% cross-linked with divinylbenzene copolymer, 3 to 15  $\mu\text{m}$  in diameter. Substrate is surface grafted with carboxylic acid and/or phosphoric acid functionalized monomers. Capacity not less than 500  $\mu\text{Eq}$ /column. [NOTE—Available as IonPac CS14 distributed by Dionex Corp. (www.dionex.com).]

**L54**—A size exclusion medium made of covalent bonding of dextran to highly cross-linked porous agarose beads, about 13  $\mu\text{m}$  in diameter.

[NOTE—Available as Superdex Peptide HR 10/30 from www.gelifesciences.com.]

**L55**—A strong cation-exchange resin made of porous silica coated with polybutadiene-maleic acid copolymer, about 5  $\mu\text{m}$  in diameter. [NOTE—Available as IC-Pak C M/D from Waters Corp. (www.waters.com).]

**L56**—Propyl silane chemically bonded to totally porous silica particles, 3 to 10  $\mu\text{m}$  in diameter. [NOTE—Available as Zorbax SB-C3 from Agilent Technologies (www.agilent.com/chem).]

**L57**—A chiral-recognition protein, ovomucoid, chemically bonded to silica particles, about 5  $\mu\text{m}$  in diameter, with a pore size of 120 Å. [NOTE—Available as Ultron ES-OVM from Agilent Technologies (www.agilent.com/chem).]

**L58**—Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the sodium form, about 6 to 30  $\mu\text{m}$  in diameter. [NOTE—Available as Aminex HPX-87N from Bio-Rad Laboratories, (2000/01 catalog, #125-0143) www.bio-rad.com.]

#### Change to read:

**L59**—▲Packing for the size-exclusion separation of proteins (separation by molecular weight) over the range of 5 to 7000 kDa. The packing is a spherical 1.5- to 10- $\mu\text{m}$  silica or hybrid packing with a hydrophilic coating.▲<sup>USP35</sup>

**L60**—Spherical, porous silica gel, 10  $\mu\text{m}$  or less in diameter, the surface of which has been covalently modified with alkyl amide groups and endcapped. [NOTE—Available as Supelcosil LC-ABZ from Supelco (www.sigmaaldrich.com/supelco).]

**L61**—A hydroxide selective strong anion-exchange resin consisting of a highly cross-linked core of 13- $\mu\text{m}$  microporous particles having a pore size less than 10 Å units and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene with a latex coating composed of 85-nm diameter microbeads bonded with alkanol quaternary ammonium ions (6%). [NOTE—Available as Ion Pac AS-11 and AG-11 from Dionex (www.dionex.com).]

**L62**—C30 silane bonded phase on a fully porous spherical silica, 3 to 15  $\mu\text{m}$  in diameter.

**L63**—Glycopeptide teicoplanin linked through multiple covalent bonds to a 100-Å units spherical silica. [NOTE—Available as Astec Chirobiotic T from Supelco (www.sigmaaldrich.com).]

**L64**—Strongly basic anion-exchange resin consisting of 8% cross-linked styrene-divinylbenzene copolymer with a quaternary ammonium group in the chloride form, 45 to 180  $\mu\text{m}$  in diameter. [NOTE—A suitable grade is available as

AG 1-X8 resin chloride form from www.discover.bio-rad.com.]

**L65**—Strongly acidic cation-exchange resin consisting of 8% sulfonated cross-linked styrene-divinylbenzene copolymer with a sulfonic acid group in the hydrogen form, 45 to 250  $\mu\text{m}$  in diameter. [NOTE—A suitable grade is available as AG 50W-X2 resin hydrogen form from www.discover.bio-rad.com.]

**L66**—A crown ether coated on a 5- $\mu\text{m}$  particle size silica gel substrate. The active site is (S)-18-crown-6-ether. [NOTE—Available as Crownpak CR(+) from Daicel (www.daicel.com).]

**L67**—Porous vinyl alcohol copolymer with a C18 alkyl group attached to the hydroxyl group of the polymer, 2 to 10  $\mu\text{m}$  in diameter. [NOTE—Available as apHera C18 from Supelco (www.sigmaaldrich.com).]

**L68**—Spherical, porous silica, 10  $\mu\text{m}$  or less in diameter, the surface of which has been covalently modified with alkyl amide groups and not endcapped. [NOTE—Available as SUPELCOSIL SUPLEX pKb-100 from Supelco (www.sigmaaldrich.com).]

**L69**—Ethylvinylbenzene/divinylbenzene substrate agglomerated with quaternary amine functionalized 130-nm latex beads, about 6.5  $\mu\text{m}$  in diameter. [NOTE—Available as CarboPac PA20 from www.dionex.com.]

**L70**—Cellulose tris(phenyl carbamate) coated on 5- $\mu\text{m}$  silica. [NOTE—Available as Chiralcel OC-H from www.chiraltech.com.]

**L71**—A rigid, spherical polymetacrylate, 4 to 6  $\mu\text{m}$  in diameter. [NOTE—Available as RSpak DE-613 from www.shodex.com.]

**L72**—(R)-phenylglycine and 3,5-dinitroaniline urea linkage covalently bonded to silica. [NOTE—Available as Sumichiral OA-3300, distributed by www.phenomenex.com.]

**L73**—A rigid spherical polydivinylbenzene particle, 5 to 10  $\mu\text{m}$  in diameter. [NOTE—Available as Jordi-Gel DBV from www.jordiflp.com.]

**L74**—a strong anion-exchange resin consisting of a highly cross-linked core of 7- $\mu\text{m}$  macroporous particles having a 100-Å average pore size and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene and an anion-exchange layer grafted to the surface, which is functionalized with alkyl quaternary ammonium ions. [NOTE—Available as IonPac AS14A from Dionex (www.dionex.com).] [NOTE—Available as IonPac AS14A from Dionex (www.dionex.com).]

**L75**—A chiral-recognition protein, bovine serum albumine (BSA), chemically bonded to silica particles, about 7  $\mu\text{m}$  in diameter, with a pore size of 300 Å.

#### Phases

**G1**—Dimethylpolysiloxane oil.

**G2**—Dimethylpolysiloxane gum.

**G3**—50% Phenyl-50% methylpolysiloxane.

**G4**—Diethylene glycol succinate polyester.

**G5**—3-Cyanopropylpolysiloxane.

**G6**—Trifluoropropylmethylpolysiloxane.

**G7**—50% 3-Cyanopropyl-50% phenylmethylsilicone.

**G8**—80% Bis(3-cyanopropyl)-20% 3-cyanopropylphenylpoly-siloxane (percentages refer to molar substitution).

**G9**—Methylvinylpolysiloxane.

**G10**—Polyamide formed by reacting a C<sub>36</sub> dicarboxylic acid with 1,3-di-4-piperidylpropane and piperidine in the respective mole ratios of 1.00:0.90:0.20.

**G11**—Bis(2-ethylhexyl) sebacate polyester.

**G12**—Phenyldiethanolamine succinate polyester.

**G13**—Sorbitol.

**G14**—Polyethylene glycol (av. mol. wt. of 950 to 1050).

**G15**—Polyethylene glycol (av. mol. wt. of 3000 to 3700).

**G16**—Polyethylene glycol compound (av. mol. wt. about 15,000). A high molecular weight compound of polyethyl-

ene glycol with a diepoxide linker. [NOTE—Available commercially as Polyethylene Glycol Compound 20M, or as Carbowax 20M, from suppliers of chromatographic reagents.]

- G17—75% Phenyl-25% methylpolysiloxane.
- G18—Polyalkylene glycol.
- G19—25% Phenyl-25% cyanopropyl-50% methylsilicone.
- G20—Polyethylene glycol (av. mol. wt. of 380 to 420).
- G21—Neopentyl glycol succinate.
- G22—Bis(2-ethylhexyl) phthalate.
- G23—Polyethylene glycol adipate.
- G24—Diisodecyl phthalate.
- G25—Polyethylene glycol compound TPA. A high molecular weight compound of a polyethylene glycol and a diepoxide that is esterified with terephthalic acid.  
[NOTE—Available commercially as Carbowax 20M-TPA from suppliers of chromatographic reagents.]
- G26—25% 2-Cyanoethyl-75% methylpolysiloxane.
- G27—5% Phenyl-95% methylpolysiloxane.
- G28—25% Phenyl-75% methylpolysiloxane.
- G29—3,3'-Thiodipropionitrile.
- G30—Tetraethylene glycol dimethyl ether.
- G31—Nonylphenoxypoly(ethyleneoxy)ethanol (av. ethyleneoxy chain length is 30); Nonoxynol 30.
- G32—20% Phenylmethyl-80% dimethylpolysiloxane.
- G33—20% Carborane-80% methylsilicone.
- G34—Diethylene glycol succinate polyester stabilized with phosphoric acid.
- G35—A high molecular weight compound of a polyethylene glycol and a diepoxide that is esterified with nitroterephthalic acid.
- G36—1% Vinyl-5% phenylmethylpolysiloxane.
- G37—Polyimide.
- G38—Phase G1 containing a small percentage of a tailing inhibitor.  
[NOTE—A suitable grade is available commercially as "SP2100/0.1% Carbowax 1500" from Supelco, Inc. (www.sigmaaldrich.com/supelco).]
- G39—Polyethylene glycol (av. mol. wt. about 1500).
- G40—Ethylene glycol adipate.
- G41—Phenylmethyldimethylsilicone (10% phenyl-substituted).
- G42—35% phenyl-65% dimethylpolysiloxane (percentages refer to molar substitution).
- G43—6% cyanopropylphenyl-94% dimethylpolysiloxane (percentages refer to molar substitution).
- G44—2% low molecular weight petrolatum hydrocarbon grease and 1% solution of potassium hydroxide.
- G45—Divinylbenzene-ethylene glycol-dimethylacrylate.
- G46—14% Cyanopropylphenyl-86% methylpolysiloxane.
- G47—Polyethylene glycol (av. mol. wt. of about 8000).
- G48—Highly polar, partially cross-linked cyanopolysiloxane.

## Supports

[NOTE—Unless otherwise specified, mesh sizes of 80 to 100 or, alternatively, 100 to 120 are intended.]

S1A—Siliceous earth for gas chromatography has been flux-calcined by mixing diatomite with  $\text{Na}_2\text{CO}_3$  flux and calcining above  $900^\circ$ . The siliceous earth is acid-washed, then water-washed until neutral, but not base-washed. The siliceous earth may be silanized by treating with an agent such as dimethyldichlorosilane [NOTE—Unless otherwise specified in the individual monograph, silanized support is intended.] to mask surface silanol groups.

S1AB—The siliceous earth as described above is both acid- and base-washed. [NOTE—Unless otherwise specified in the individual monograph, silanized support is intended.]

S1C—A support prepared from crushed firebrick and calcined or burned with a clay binder above  $900^\circ$  with subsequent acid-wash. It may be silanized.

S1NS—The siliceous earth is untreated.

S2—Styrene-divinylbenzene copolymer having a nominal surface area of less than  $50 \text{ m}^2$  per g and an average pore diameter of 0.3 to  $0.4 \mu\text{m}$ .

S3—Copolymer of ethylvinylbenzene and divinylbenzene having a nominal surface area of 500 to  $600 \text{ m}^2$  per g and an average pore diameter of  $0.0075 \mu\text{m}$ .

S4—Styrene-divinylbenzene copolymer with aromatic -O and -N groups, having a nominal surface area of 400 to  $600 \text{ m}^2$  per g and an average pore diameter of  $0.0076 \mu\text{m}$ .

S5—40- to 60-mesh, high-molecular weight tetrafluoroethylene polymer.

S6—Styrene-divinylbenzene copolymer having a nominal surface area of 250 to  $350 \text{ m}^2$  per g and an average pore diameter of  $0.0091 \mu\text{m}$ .

S7—Graphitized carbon having a nominal surface area of  $12 \text{ m}^2$  per g.

S8—Copolymer of 4-vinyl-pyridine and styrene-divinylbenzene.

S9—A porous polymer based on 2,6-diphenyl-*p*-phenylene oxide.

S10—A highly polar cross-linked copolymer of acrylonitrile and divinylbenzene.

S11—Graphitized carbon having a nominal surface area of  $100 \text{ m}^2$  per g modified with small amounts of petrolatum and polyethylene glycol compound.

S12—Graphitized carbon having a nominal surface area of  $100 \text{ m}^2$  per g.

# Reference Tables

## CONTAINERS FOR DISPENSING CAPSULES AND TABLETS

The following table is provided as a reminder for the pharmacist engaged in the typical dispensing situation who already is acquainted with the *Packaging and Storage* requirements set forth in the individual monographs. It lists the capsules and tablets that are official in the *United States Pharmacopeia* and indicates the relevant tight (T), well-closed (W), and light-resistant (LR) specifications applicable to containers in which the drug that is repackaged should be dispensed.

This table is not intended to replace, nor should it be interpreted as replacing, the definitive requirements stated in the individual monographs.

**Container Specifications for Capsules and Tablets**

Monograph Title	Container Specification
Abacavir Tablets	W
Acebutolol Hydrochloride Capsules	T
Acepromazine Maleate Tablets	T, LR
Acetaminophen Capsules	T
Acetaminophen Tablets, Extended-Release	T
Acetaminophen Tablets	T
Acetaminophen and Aspirin Tablets	T
Acetaminophen, Aspirin, and Caffeine Tablets	T
Acetaminophen and Caffeine Tablets	T
Acetaminophen and Salts of Chlorpheniramine, Dextromethorphan, and Phenylpropanolamine, Capsules Containing at Least Three of the Following—	T
Acetaminophen and Salts of Chlorpheniramine, Dextromethorphan, and Phenylpropanolamine, Tablets Containing at Least Three of the Following—	T
Acetaminophen and Salts of Chlorpheniramine, Dextromethorphan, and Pseudoephedrine, Capsules Containing at Least Three of the Following—	T
Acetaminophen and Salts of Chlorpheniramine, Dextromethorphan, and Pseudoephedrine, Tablets Containing at Least Three of the Following—	T
Acetaminophen, Chlorpheniramine Maleate, and Dextromethorphan Hydrobromide Tablets	T
Acetaminophen and Codeine Phosphate Capsules	T, LR
Acetaminophen and Codeine Phosphate Tablets	T, LR
Acetaminophen and Diphenhydramine Citrate Tablets	T
Acetaminophen, Diphenhydramine Hydrochloride, and Pseudoephedrine Hydrochloride Tablets	T
Acetaminophen and Pseudoephedrine Hydrochloride Tablets	T
Acetaminophen and Tramadol Hydrochloride Tablets	T
Acetazolamide Tablets	T
Acetohexamide Tablets	W
Acetohydroxamic Acid Tablets	T
Acitretin Capsules	W, LR

**Container Specifications for Capsules and Tablets (Continued)**

Monograph Title	Container Specification
Acyclovir Capsules	T
Acyclovir Tablets	T
Albendazole Tablets	T
Albuterol Tablets	T, LR
Alendronate Sodium Tablets	T
Allopurinol Tablets	W
Alprazolam Tablets	T, LR
Alprazolam Tablets, Extended-Release	T, LR
<b>Add the following:</b>	
▲Alprazolam Tablets, Orally Disintegrating	T ▲ <sup>USP35</sup>
Altretamine Capsules	T, LR
Alumina and Magnesia Tablets	W
Alumina, Magnesia, and Calcium Carbonate Tablets	W
Alumina, Magnesia, Calcium Carbonate, and Simethicone Tablets	W
Alumina, Magnesia, and Simethicone Tablets	W
Alumina and Magnesium Carbonate Tablets	T
Alumina, Magnesium Carbonate, and Magnesium Oxide Tablets	T
Alumina and Magnesium Trisilicate Tablets	W
Aluminum Carbonate Gel, Dried Basic, Capsules	W
Aluminum Carbonate Gel, Dried Basic, Tablets	W
Aluminum Hydroxide Gel, Dried, Capsules	W
Aluminum Hydroxide Gel, Dried, Tablets	W
Amantadine Hydrochloride Capsules	T
Amiloride Hydrochloride Tablets	W
Amiloride Hydrochloride and Hydrochlorothiazide Tablets	W
Aminobenzoate Potassium Capsules	W
Aminobenzoate Potassium Tablets	W
Aminocaproic Acid Tablets	T
Aminoglutethimide Tablets	T, LR
Aminopentamide Sulfate Tablets	W
Aminophylline Tablets	T
Aminophylline Tablets, Delayed-Release	T
Aminosalicylate Sodium Tablets	T, LR
Aminosalicylic Acid Tablets	T, LR
Amitriptyline Hydrochloride Tablets	W
Amlodipine Besylate Tablets	T, LR
Ammonium Chloride Tablets, Delayed-Release	T
Amodiaquine Hydrochloride Tablets	T
Amoxapine Tablets	W
Amoxicillin Capsules	T
Amoxicillin Tablets	T
Amoxicillin and Clavulanate Potassium Tablets	T
Amphetamine Sulfate Tablets	W
Ampicillin Capsules	T
Ampicillin Tablets	T
Anileridine Hydrochloride Tablets	T, LR
Apomorphine Hydrochloride Tablets	T, LR
Arginine Capsules	T, LR
Arginine Tablets	T, LR
Ascorbic Acid Tablets	T, LR