

Find all your Classic Column  
Chromatography needs in one place.

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# Column Chromatography and Related Products

## Stationary Phase



### Silica Gels

Aldrich® Chemistry offers the broadest range of silica gel products from low-cost irregular silica to high-quality bonded phases and spherical silica manufactured under highly controlled processes.

### High Purity Silica Gel

Our highest purity silica gel features:

- Narrowest particle size distribution
- Lowest moisture content
- Greatest lot-to-lot consistency and overall performance
- Minimal impurities, such as metallic oxides

Cat. No.	Particle Size	Moisture Content %	Pore Size (Å)	Particles within Distribution Range
60737	230-400 mesh 40-63 µm	3-7	60 Å	>90%
60738	220-440 mesh 35-75 µm	3-7	60 Å	>90%
60741	70-230 mesh 63-200 µm	3-7	60 Å	>90%

### Technical Grade Silica Gel

These are our most economical Aldrich silica gel products, ideal for less critical, day-to-day separations.

- Contract pricing available
- Best value product for day-to-day separations

Cat. No.	Particle Size	Pore Size (Å)
717185	230-400 mesh 40-63 µm	60 Å
717177	70-230 mesh 63-200 µm	60 Å

For more information on these products and a complete list of silica gel products, visit

[Aldrich.com/silicagel](http://Aldrich.com/silicagel)

### Column Packing Materials

To aid in the filtration process, additional column packing materials are available.



Cat. No.	Packing Material
161551	Activated Charcoal, decolorizing
22140	Celite® 545, filter aid, treated with sodium carbonate, flux calcined
22139	Celite Filter Cel, filter aid, slightly calcined
CLS3950	Pyrex® fiber glass wool
274739	Sand, -50-70 mesh particle size

### What Size Column Do I Need?

Use this handy chart to estimate the typical fraction and sample sizes when using Aldrich Chromatography Columns.

- **Filtration** – Simple separation of baseline impurity that elutes at significantly different  $R_f$  values.
- **Separation** – Removing one or more impurities that have close  $\geq 0.1 R_f$  values.

Methods		Aldrich Chromatography Columns		Collection
Filtration Sample Size (g)	Separation Sample Size (g)	Column O.D. x L (mm)	Column Capacity (mL)	Fraction Size (mL)
5	1-2	25 x 584	200	10
10	3-5	38 x 560	400	20
20	5-8	44 x 572	600	30
30	10	57 x 508	1,000	50
60	20-30	76 x 560	2,000	100
100	50	—	4,000	150-200
200	100	—	8,000	250-400
300	150-200	—	20,000	500-750

## Chromatography Columns and Mobile Phases

### Glass Chromatography Columns

Flash chromatography is useful for rapid, preparative separations with moderate resolutions. As first described in *J. Org. Chem.*, **43**, 2923 (1978), it is commonly performed with silica gel.

Aldrich manufactures an extensive line of standard chromatography columns and those with Porosity C fritted discs, solvent reservoirs and flow controllers with PTFE needle valves.

Column sizes from 100 mL to 2,000 mL include multiple configurations for your applications:

#### Ball Joints

- 28/12, 29/15, 50/30, 65/40, and 75/50
- Enable rapid, preparative separations with moderate resolutions

#### Threaded Standard Taper Joints

- 24/40, 29/32, and 45/40
- Grease-free design eliminates contamination and frozen joints

#### EZSafe™ Connections

- Improved low-pressure columns (max. 7 psig)
- Eliminates bottom tip breakage with removable PTFE drip-tip
- Grease-free GL 45 screw-thread connections

To learn more about our full selection of Chromatography Columns, visit

[Aldrich.com/columns](http://Aldrich.com/columns)

### Aldrich® Solvent-Pouring Funnel

Unique, closed-end design has 2 mm diameter holes in the stem permitting the gentle addition of solvents without disturbing the silica gel.



Z548790



### Solvents for Column Chromatography

Cat. No.	Snyder Polarity Index	Solvents
320072	9.0	Water, ACS
179337	6.6	Methanol, ACS
472301	6.5	Dimethyl sulfoxide, ACS
319937	6.4	<i>N,N</i> -Dimethylformamide, ACS
360457	6.2	Acetonitrile, ACS
459844	5.2	Ethanol, ACS, absolute
179124	5.1	Acetone, ACS
360481	4.8	1,4-Dioxane, ACS
319902	4.3	Ethyl acetate, ACS
190764	4.3	2-Propanol, ACS
34865	4.2	Tetrahydrofuran, inhibitor-free, HPLC
D65100	3.4	Dichloromethane, amylene stabilized, ACS
309966	2.9	Diethyl ether, inhibitor-free, HPLC
317195	2.4	<i>p</i> -Xylene, HPLC
179418	2.3	Toluene, ACS
398276	2.2	Diisopropyl ether, BHT stabilized, ACS
270652	1.7	Carbon tetrachloride, HPLC
179191	0.0	Cyclohexane, ACS
154954	0.0	Pentane, Spectrophotometric
178918	0.0	Hexanes, ACS
154873	0.0	Heptane, Spectrophotometric

Reference: Snyder, L.R., *Journal of Chromatographic Science*, **16(6)**, June 1978, pp. 223-234(12)

To see all our available solvents and grades, visit

[Aldrich.com/solvents](http://Aldrich.com/solvents)

### Column Modifiers

These modifiers allow you to optimize the resolution and selectivity of your column.

Cat. No.	Modifiers
695092	Acetic acid, ACS, ≥99.7%
221228	Ammonium hydroxide solution, ACS, 28.0-30.0% NH <sub>3</sub> basis
399388	Formic acid, ACS, ≥88.0%
695017	Phosphoric acid, ACS, ≥85 wt. % in H <sub>2</sub> O
415413	Sodium hydroxide solution, 50% in H <sub>2</sub> O
209139	Silver nitrate, ACS, ≥99.0%
T0886	Triethylamine, ≥99%
T6508	Trifluoroacetic acid, ReagentPlus®, 99%

## Mobile and Visual Phase

### TLC Plates and Development Tanks

Featuring a complete line of TLC plates including glass, PET, and aluminum foil backings. We provide you with a broad offer from industry leaders such as:

- Sigma-Aldrich®
- Merck KGaA
- Analtech, Uniplates™
- Macherey-Nagel, ADAMANT™



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To view our full selection of TLC Plates and Development Tanks, visit [Aldrich.com/tlc](http://Aldrich.com/tlc)

### Visualizing TLC Plates

Indicators used to develop spots on your TLC plates.

Cat. No.	Product	Typical Dilution Value
207772	Iodine, ACS	N/A
319279	Phosphomolybdic acid solution	20% in ethanol
258105	Sulfuric acid, ACS	10% in water
223468	Potassium permanganate, ACS	Dissolve potassium permanganate (3 g) and potassium carbonate (20 g) in 5% aqueous sodium hydroxide (5 mL) and water (300 mL)
Z284661	Spectroline® UV lamp, battery-operated	If toluene used to develop the plate, dry with heat gun before visualizing



Z284661

### Optimizing the Separation

Use this helpful chart to decide on the best combination of solvents and modifiers for better separations.

Solvent Systems	Common Ratios	Application
Cyclohexane: Ethyl acetate	9:1	Less polar compounds: • Esters • Ketones • Aldehydes • Indanones
Cyclohexane: Dichloromethane	2:3	Indoles Azaindoles Pyrroles Pyrazoles
Cyclohexane: Triethylamine: Ethanol	7:2:1	Alkylaminopyridines Alkylaminoquinolines Alkylaminoquinolines Alkylaminoheterocycles
Toluene: Ethyl acetate: Acetic acid	25:4:1	Carboxylic acids Benzoic acids Cinnamic acids Arylalkanoic acids
Chloroform: Ethanol: Acetic acid	200:10:1	Phenols Carboxylic acids Hydroxycinnamic acids Salicylic acids Hydroxyheterocycles
Cyclohexane: Triethylamine: Ethanol	4:3:3	Very Polar Compounds: • Heteroaryl amines • Diamines • Diols

The above TLC Solvent Systems were recommended by Lubomir Janda, Principal R&D Scientist, Sigma-Aldrich Co.

### Application Tips:

1. Generally, dichloromethane will take longer to run through the silica than other solvents.
2. A 1-3% triethylamine addition in your solvent system will neutralize acid in the silica gel.
3. Hexanes can be used instead of cyclohexane. However, hexanes have the potential for static build-up.

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