



Chemical Resistances for Beckman Coulter Centrifugation Products

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The information provided here is from references, from current literature, or from research done by Beckman Coulter, Inc., and is only a guide for the selection of materials. No guarantee of safety based on these recommendations is expressed or implied. Many of the chemicals are explosive when concentrated or dry, or are toxic, caustic, allergenic, or carcinogenic. Observe proper handling as outlined by your laboratory safety officer.

INTRODUCTION

This table indicates the general chemical resistances of various materials to a number of chemicals commonly used in procedures involving Beckman Coulter centrifuges and accessories. You can select a chemical and determine the resistance of listed materials to the selected chemical—either satisfactory (S), marginally satisfactory (M), unsatisfactory (U), or unknown (X). Marginal resistance listings may be a combination of S and U resistances.

Materials are listed alphabetically. Chemicals are listed alphabetically by their most common name within seven categories (acids, bases, salts, gradient-forming materials, solvents, detergents, and other). Where applicable, an IUPAC (International Union of Pure and Applied Chemistry) name is shown beneath a trivial chemical name. Chemicals are either undiluted liquids or saturated (unless otherwise noted) aqueous solutions. Materials that have unsatisfactory or marginal resistance to the high concentrations used for these tests may be usable in very low (that is, millimolar) concentrations.

TEST YOUR SOLUTION UNDER OPERATING CONDITIONS IF MATERIAL PERFORMANCE IS UNCERTAIN.

Soak tests at $1 \times g$ (at 20°C) established the data for most of the materials. In some cases the resistances of tube materials also reflect their performance under centrifugation. Thus, although alcohols (for example) may be stored satisfactorily in polycarbonate or in Ultra-ClearTM containers, ethanol will destroy these tubes in a short period of high-speed centrifugation. This combination of material and chemical is therefore listed as U in the table. Not all combinations have been tested under the stress of centrifugation, however. Again, pretesting under actual run conditions is strongly advised.

The data for centrifuge and rotor finishes is derived mainly from splash tests in which the finish was exposed to the chemical for a matter of minutes. Satisfactory resistance under long-term exposure should not be assumed.

DECONTAMINATION OF ALUMINUM ROTORS AND ACCESSORIES

While a number of solutions are commercially marketed for use in removing radioactivity from contaminated materials, many are too harsh for use on anodized aluminum. Beckman Coulter has tested a number of solutions and found two that do not harm anodized aluminum:

- IsoClean Solution (for soaking) or RadCon Surface Spray (In U.S.A., contact Nuclear Associates [New York]; in Eastern Europe and Commonwealth States, contact Victoreen GmbH [Munich]; in South Pacific, contact Gammasonics Pty. Ltd. [Australia]; in Japan, contact Toyo Medic Co. Ltd. [Tokyo].)
- Radiacwash (In U.S.A., contact Biodex Medical Systems [Shirley, New York]; internationally, contact the U.S. office to find the dealer nearest you.)

While Beckman Coulter has tested these methods and found that they do not damage components, no guarantee of decontamination is expressed or implied. Consult your laboratory safety officer regarding the proper decontamination methods to use.

If a rotor and/or accessories are contaminated with toxic or pathogenic solutions, follow appropriate sterilization or disinfection procedures as outlined by your laboratory safety officer.

REGISTERED TRADEMARKS

| Alconox | Alconox, In. |
|-------------------|--|
| Delrin | E.I. Du Pont de Nemours & Company |
| Ficoll-Pacque | Pharmacia Fine Chemicals |
| Freon | E.I. Du Pont de Nemours & Company |
| Haemo-Sol | Meinecke & Co., Inc. |
| Hytrel | E.I. Du Pont de Nemours & Company |
| Mylar | E.I. Du Pont de Nemours & Company |
| Noryl | GE Plastics |
| Plexiglass | Rohm and Haas Co. |
| Polyallomer | Eastman Chemical Company |
| Radel | BP Amoco |
| Rulon | Furen Corp. |
| Silastic | Dow Corning Corp. |
| Teflon | E.I. Du Pont de Nemours & Company |
| Triton X-100 | Rohm and Haas Co. |
| Tygon | Norton Performance Plastics |
| Ultem | General Electric |
| Viton | Du Pont Dow Elastomers |
| Zephiran Chloride | Winthrop Laboratories, Sterling Drug Co. |

| Chemicals IUPAC Name | dCores (| Colon, Colon, | eluni: loletiner los | 8(11)2 (1985) (0) | Contra Contraction | Control Control | CODON 1/20> | Control of the second s | Flond Cotal allon | (1000 Mar Moor | Contesti Miller | WW W COST | 1001. 0000 | Morense Conoon | on Control (October 1) | Dail 60 | CT Way | down of the second | DOL GHONS. | DOLLETO . | Dounder (HUDA) | DOLOD KONED | Porto of the Port | DOLLING DOLLING | Contraction of the second | DOLUCION COLORIDON | Real Colleging | Child Solid Control Co | City and Co | Silic And | Service Servic | Little of the second se | Lon (1) Col | Currentia. | Mo olo un | Li. Cooring |
|---|----------|---------------|----------------------|-------------------|--------------------|-----------------|-------------|--|-------------------|----------------|-----------------|-----------|------------|----------------|------------------------|---------|--------|--------------------|------------|-----------|----------------|-------------|-------------------|-----------------|---------------------------|--------------------|----------------|--|-------------|-----------|--|--|-------------|------------|----------------|-------------|
| ACIDS (aq) acetic acid (5%) ethanoic acid | S | S | S | S | S | S | S | S | S | S | S | S | S | S | M ¹ | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | М | S | S | S | U | S |
| acetic acid (60%) ethanoic acid | U | U | S | S | S | S | S | U | S | S | S | S | S | S | U | S | S | U | М | М | М | М | S | М | S | U | S | S | S | М | U | S | Μ | М | U | М |
| acetic acid (glacial) ethanoic acid | U | U | S | S | S | S | S | U | М | S | S | S | U | S | U | М | S | U | U | U | *** | U | U | U | S | U | М | S | S | U | U | S | М | U | U | U |
| boric acid | S | S | S | U | S | S | S | U | S | S | S | S | S | S | M ⁸ | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S |
| chromic acid (10%) | U | S | S | U | S | U | S | U | U | U | U | S | U | S | U | S | S | S | U | U | S | М | U | U | S | U | Х | S | S | U | U | S | S | S | S | S |
| citric acid 2-hydroxy-1,2,3- propanetricarboxylic acid | S | S | S | М | S | S | S | U | S | S | S | S | S | S | М | S | S | S | S | М | S | М | S | S | М | S | S | S | S | S | S | S | S | S | S | S |
| hydrochloric acid (10%) | U | S | Μ | U | U | М | S | U | S | S | S | S | S | S | U | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | U | М | S | S | Μ | S |
| hydrochloric acid (50%) | U | U | S | U | U | М | S | U | М | U | U | U | Μ | S | U | S | U | U | S | S | S | М | S | S | S | М | S | S | М | М | U | U | Μ | S | U | S |
| iodoacetic acid 2-iodoethanoic acid | S | U1 | S | S | S | М | S1 | S1 | S | S | S | S1 | М | S | S1 | U | S | S | S1 | S | S1 | S1 | S1 | U | S1 | S | Х | S | М | М | S | S | М | S | M ¹ | М |
| mercaptoacetic acid 2-mercaptoethanoic acid | S | U | S | U4 | S | U | S | S | Х | М | Μ | S | М | S | U | U | S | U | U | U | U | S | S | U | U | M ¹ | Х | S | U | U | S | S | S | S | U | S |
| nitric acid (10%) | U | S | Μ | U | S | U | S1 | U | М | U | U | S | U | S | U | S | S | S | S | S | S | U | S | U | S | S ² | S | S | S | М | S | S | S | S | Μ | S |
| nitric acid (50%) | U | U | S | U | S | U | S1 | U | U | U | U | U | U | S | U | U | U | М | М | М | S | U | U | U | U | S ² | U | S | М | U | S | S | Μ | М | U | S |
| oleic acid <i>cis</i> -9-octadenoic acid | S | S | S | S | Х | S | S | U | М | S | S | Х | U | S | S | S | Х | S | М | М | S ² | М | S | S | М | S | S | S | Х | U | U | S | U | S | S | М |

M = marginal resistance

U = unsatisfactory resistance

X = unknown

Flammability hazard. Not recommended for use in any type of centrifuge because vapors may be ignited by exposure to electrical contacts. Depending on the centrifuge type, such exposure could occur either during normal centrifugation or under failure conditions. ¹ discloloration

²below 26°C only

explosion hazard due to possible material/chemical reaction under rotor failure conditions

⁴dilute solutions satisfactory

⁵below 21°C only

⁶nonaqueous

⁷most aluminum components have anodic coating finishes

⁸ avoid high temperatures at high concentrations

⁹nickel acetate unsatisfactory

Chemicals

| | | | er (cor | 88) (CO) | | | 1 | | | | hund | | 0000 | 0000 | N.C. | | | ⁶ ov | | | Dor) | -00- 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1 | thomas | 200 Moor | | le. | Si'l's | 20 DI | 5 | | | | | | C) | , |
|---|--------------------|----------------|--------------|------------|-------------------|--------------|-------|-------------|-----------------|---------|----------|--|----------|-----------------------|--------------|--------------|---------|--|----------------|-----------|----------------|---|----------------|----------------------------|--------------|-------------------|--------|---------------|------------|---|------------|--------------|----------------|------------|-----------|---------------|
| Chemicals IUPAC Name | ^d Coto, | Children Cool | alini alerin | Self eline | & Contraction (C) | Duco Colitic | COOO. | Colliner of | Elon Scot allon | r. 4.00 | Soot asi | Will Sold and a sold and a sold a sol | 1900-190 | Month of the Constant | O CONTROLING | Delin, 16 01 | CT WOLL | 00000000000000000000000000000000000000 | 0000000 | DOLOU NOV | DOM DOLOGICAL | 2) MODION | out of the log | A CONTRACTION OF THE OWNER | NOV TO TO TO | DONUS CONCINCIANO | A W Ch | Hand Sold Bar | Silver Off | Con | Stein CUCK | liter of the | 12 Chr. T | Un not the | Wook C. M | Little of the |
| ACIDS (continued) oxalic acid ethanedioic acid | U | S | S | U | U | М | S | U | S | S | S | S | S | S | М | S | S | U | S | М | S | S | S | S | S | S | S | S | S | М | U | S | S | S | U | S |
| perchloric acid (70%) | U | S | S | U | U | U | Μ | U | Μ | U | 333 | S | U | М | U | S | S | U | М | М | Μ | U | U | U | S | М | Х | S | U | U | U | S | U | U | U | S |
| phosphoric acid mixture (10%) | U | S | Μ | U | U | М | S | U | S | S | S | S | S | S | U | S | S | S | S | S | S | S | S | М | S | S | Х | S | S | S | Μ | U | S | S | S | S |
| phosphoric acid mixture (50%) | U | S | Μ | U | U | U | S | U | S | М | М | S | U | S | U | S | S | S | S | S | S | S | S | U | S | S | Х | S | S | U | U | U | S | S | S | S |
| picric acid 2,4,6-trinitrophenol | S | U | S | S | S | U | S | S1 | Μ | М | Μ | S | М | S | U | S | S | S | S | U | S | S | S | U | S1 | U | U | S | S1 | U | М | S | M ¹ | х | S | S |
| saturated fatty acids | S | U | S | S | Х | S | S | S | М | S | S | Х | S | S | S | S | Х | S | S | Μ | S | S | S | S | Μ | S | S | S | S | Μ | Μ | S | S | Х | S | S |
| stearic acid octadecanoic acid | S | U | S | U | Х | S | S | S | М | S | S | Х | М | S | S | S | Х | S | S | М | S | S | S | S | Μ | S | S | S | S | М | М | S | S | S | Х | S |
| sulfosalicylic acid 3-carboxy-4-hydroxy- benzenesulfonic acid | S | S | S | U | U | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | S | S | х | S | S | S | S | S | S | U | S | S | S | S | S |
| sulfuric acid (10%) | U | S | Μ | U | U | М | S | U | М | U | U | S | S | S | U | S | S | S | S | S | S | S | S | S | Μ | S | S | S | S | U | U | U | S | S | S | S |
| sulfuric acid (50%) | U | U | Μ | S | U | U | S | U | U | U | U | Μ | Μ | S | U | S | М | U | S | S | S | S | S | М | U | S | S | S | S | U | U | U | U | S | U | S |
| thiogylycolic acid | U | U | S | U4 | S | U | S | S | Х | М | S | S | Μ | S | U | U | S | U | U | U | U | S | U | U | U | M ¹ | Х | S | U | U | S | S | S | Х | U | U |
| tricloroacetic acid trichloroethanoic acid | U | U | S | U | U | U | S | U | М | S | S | U | U | S | U | М | U | М | S ² | U | S | U | U | U | S | U | Х | S | U | U | U | U | М | Х | U | U |
| unsaturated fatty acids | S | S ² | S | S | Х | S | S | U | Μ | S | S | Х | U | Х | S | S | Х | S | Μ | М | S ² | М | Μ | S | Μ | S | S | S | Х | М | U | S | Μ | S | S | М |
| BASES (aq) ammonium hydroxide (10%) | S | S | S | U | U | S | S1 | U | S | S | S | U | S | S | U | S | U | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | М | U | S |

S = satisfactory resistance

M = marginal resistance

U = unsatisfactory resistance

X = unknown

= Flammability hazard. Not recommended for use in any type of centrifuge because vapors may be ignited by exposure to electrical contacts. Depending on the centrifuge type, such exposure could occur either during normal centrifugation or under failure conditions.

¹ discloloration

²below 26°C only

xx explosion hazard due to possible material/chemical reaction under rotor failure conditions ⁴ dilute solutions satisfactory

⁵below 21°C only

⁶nonaqueous

⁷most aluminum components have anodic coating finishes

⁸ avoid high temperatures at high concentrations

⁹nickel acetate unsatisfactory

| Chemicals IUPAC Name | ² Cota | 211,000 L | Unit ale tion Car | aline ales (0) | South South | Color Color | 200, Vr. | Contraction of the second | DA CONTRACTOR | (Sel of the the | of the series | La colin | 1000- 0000 0000 0000 00000 00000 00000000 | North Control of the | oj. | Delight 60 | AN A | A CONTRACTION OF THE CONTRACT OF THE CONTRACT. | OL OLOS | OUNDER LO | A selection of the sele | OLON ROPE | O THE OCOUNT. | Douter of the solution | 10000000000000000000000000000000000000 | M. Starting | Pages, Chicain, | A CONTRACTION OF COLORISA | Series C | silico and con | | It 1000 US | \$ 5 S | Charles Price | Dool C. H | Libon Gerla |
|--|-------------------|-----------|-------------------|----------------|-------------|-------------|----------------|---------------------------|---------------|------------------|----------------|----------|---|---|---------|------------|--|---|---------|-----------|--|-----------|---------------|------------------------|--|-------------|-----------------|---------------------------|----------|----------------|--------|------------|---------------|---------------|-----------|-------------|
| BASES (aq) (continued) ammonium hydroxide (28%) | °∕ S | ଙ S | ନ୍ତ S | ° U | ° ∪ | ∞ M | S ¹ | V | S | ø × | ø × M | 0 | S | R S | ر. ک | Q' S | U | Q U | Q S | х S | Q S | Q S | Q S | Q S | s | Q S | چہ S | ۰ ۲ | S | s S | s S | -∜" S | <i>₹</i> M | U | U | s. |
| aniline benzenamine | S | U | S | S | S | U | U | S | М | U | U | S | U | U | U | М | S | U | U | U | S | U | U | U | U | U | Х | S | М | U | S | S | U | U | U | S |
| potassium hydroxide (5%) | S | М | S | U | U | S | S | U | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | М | U | S | S | S | Μ | U |
| potassium hydroxide (45%) | S | U | S | U | U | S | S | U | S | S | U | Μ | S | S | U | S | Μ | U | S | S | U | М | S | М | S | S | S | S | S | М | U | U | S | S | U | U |
| pyridine (50%) azabenzene | М | U | S | U | S | U | М | М | М | U | U | S | U | U | S | U | S | U | U | U | S | U | U | U | S | U | Х | S | S | U | U | U | U | U | U | U |
| sodium hydroxide (1%) | S | S | М | U | U | S | S | U | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U |
| sodium hydroxide (>1%) | S | S | М | U | U | S | S | U | S | S | S | U | S | S | U | S | U | U | S | S | S | S | S | S | Μ | S | S | S | S | S | S | S | М | S | U | U |
| SALTS (aq) aluminum chloride | U | S | S | U | U | S | S | U | S | S | S ² | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | М | М | U | U | S | s | S | S |
| ammonium acetate ammonium ethanoate | S | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | U |
| ammonium carbonate | S | S | S | М | S | U | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | Μ | S | S | S | S | S |
| ammonium phosphate | S | S | S | U | Х | S | S | S | S | S | S | Х | S | S | S | S | Х | S | S | S | S | S | S | S | Х | S | S | S | Х | S | М | S | S | S | S | S |
| ammonium sulfate | S | S | S | U | Μ | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | S | U |
| barium salts | S | S | S | М | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | Μ | S | S | S | S | S |
| calcium chloride | S | S | Μ | М | U | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | Μ | S | S | S | S | S |
| guanidine hydrochloride 1-aminomethanamidine hydrochloride | S | S | S | U | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | х | S | S | S | S | S | S | U | S | S | S | S | S |

M = marginal resistance

U = unsatisfactory resistance

X = unknown

Flammability hazard. Not recommended for use in any type of centrifuge because vapors may be ignited by exposure to electrical contacts. Depending on the centrifuge type, such exposure could occur either during normal centrifugation or under failure conditions.

¹ discloloration

²below 26°C only

explosion hazard due to possible material/chemical reaction under rotor failure conditions

⁴dilute solutions satisfactory

⁵below 21°C only

⁶nonaqueous

⁷ most aluminum components have anodic coating finishes

⁸ avoid high temperatures at high concentrations

⁹nickel acetate unsatisfactory

| | dog, | | Der Cou | (LO) (38) | 6 | | (0) | Contraction of the second | College Co | non tomos | ON CONTROL | | 600 | Month Starter | O | | | Constant in the second | | ×0 | (HDP) | CD CD | 1 ton | Outro ochino | | 111 | Deliny | in de | 5 | 60 | | ø | | | o Al | N |
|--|----------------|----------------|-----------|-------------------|-------------------|----------|------------|---------------------------|--|-----------|------------|----------|-----|---|-------------|----------|--|---|--------------|------------|----------------|--------------|------------|----------------------|--------------|------------|-----------|-------------|----------------|-----------|-----------------|-----------|-------------|------------------|--------|------------|
| Chemicals IUPAC Name | d Core | CUN: COO | ell'and a | alling (1) alling | South Contraction | CO CO CO | C000, | Control Control | | A of | Sol to Sol | W. TOSIN | | More Solution | 21/00 00 01 | Daine Of | WALL AND | 000000000000000000000000000000000000000 | PON PON PONS | DOLLAND OF | No No No No | DOLOOUS STOC | out of the | NOO NUT ON THE OWNER | DOL ON COLOG | OCHERT INO | have have | Con Con Con | Signal College | Silio (P) | Stering Control | lities of | I. I. I. I. | Children and the | i. JHO | Lix Closer |
| SALTS (aq) (continued) magnesium chloride | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| nickel salts | S | S | S | U | S | S | S | S | S | S | S | S | Μ | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| potassium bromide | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| potassium carbonate | S ² | M ¹ | S | М | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| potassium chloride | S | S | Μ | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S |
| potassium permanganate | S | S ² | S1 | S | S | S | S | S | S | S | S | S | S4 | S | U | S | S | S | S | S | S ² | М | S1 | U | М | U | S | S | S1 | S1 | М | S | U | S | S1 | Μ |
| silver nitrate | S | S | S | U | S | М | S | S | S | S | S | S | S4 | S | S | S | S | S | S | S | S | S | S | Х | М | S | S | S | S | S | М | S | S | S | S | S |
| sodium borate | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | М | S | S | S | S | S |
| sodium carbonate | S | S | S | М | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| sodium chloride | S | S | S | U | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| sodium nitrate | S | S | S | S | S | S | S | S | S | S | S | S | Μ | S | S | S | S | U | S | S | S | S | S | М | S | S | S | S | S | U | S | S | S | S | S | S |
| sodium sulfate | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | М | S | S | S | S | S |
| sodium sulfite | S | S | S | S ² | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S |
| zinc chloride | S | S | S | U | U | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | U | S | S | S | S | S |
| zinc sulfate | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S |
| GRADIENT FORMING MATERIALS (aq) cesium acetate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| cesium ethanoate | S | S | S | М | Х | S | S | S | S | S | S | Х | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | S | S | S | Μ | S | S | S | Х | S |

Chemi

S = satisfactory resistance

M = marginal resistance

U = unsatisfactory resistance

X = unknown

cesium bromide

Flammability hazard. Not recommended for use in any type of centrifuge because vapors may be ignited by exposure to electrical contacts. Depending on the centrifuge type, such exposure could occur either during normal centrifugation or under failure conditions.

S S

S M

S S S S

¹ discloloration

S

S S S S S S S

²below 26°C only

xx explosion hazard due to possible material/chemical reaction under rotor failure conditions

S

S

S

S S S Μ S S

S

S S (Hell JHROC JNOC I

S S

S

⁴ dilute solutions satisfactory

⁵below 21°C only

⁶nonaqueous

⁷ most aluminum components have anodic coating finishes

⁸ avoid high temperatures at high concentrations

S S S S S

⁹nickel acetate unsatisfactory

| Chemicals IUPAC Name | dog | acticoon | ellinii (loti) (Co. | 81(1)2 (3(38) (1)2 (1) | 000. 10 - 00 - 00 - 00 - 00 - 00 - 00 - | CO C | CO00. 11 11/02 | Contraction of the second | thom a cost allo | South the works | South | A A A A A A A A A A A A A A A A A A A | 1800 Cholon | 10,000,000,000,000,000,000,000,000,000, | on of the ofference of the | Delin, 66, | C ANN XXX | 000 100 100 100 100 100 100 100 100 100 | DON. DON. | op the star | Address Coloring | DOL DU COLO ROLLON | DOL CONCORD | Columba Columba | ON THE PARTY OF THE PARTY OF | Contraction in the | Part Maine | A CONTRACTION OF THE OFFICE | Silver (C) | Silic (A) | | It is of the second | Jours Col | Ling and the strike | Who of the | Liton Cooring |
|---|-----|----------|---------------------|------------------------|---|--|----------------|---------------------------|------------------|-----------------|---|---------------------------------------|-------------|---|----------------------------|------------|-----------|---|-----------|-------------|------------------|--------------------|-------------|-----------------|------------------------------|--------------------|------------|-----------------------------|------------|-----------|---|---------------------|-----------|---------------------|------------|---------------|
| GRADIENT FORMING MATERIALS (aq) (cont'd) cesium chloride | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| cesium formate cesium methanoate | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | Х | S | S | S | S | S | S | М | S | S | S | S | S |
| cesium iodide | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| cesium sulfate | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | М | S | S | S | S | S |
| dextran or dextran sulfate | S | S | S | М | S | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | Х | S | S | S | S | S | S | Μ | S | S | S | S | S |
| Ficoll-Paque | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | Μ | S | S | S | S | S |
| glycerol 1,2,3-propanetriol | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| metrizamide | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | Х | S | S | S | S | S | S | М | S | S | S | S | S |
| rubidium bromide | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| rubidium chloride | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| sodium bromide | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| sodium iodide | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| sucrose β-D-fructofuranosyl-α- D-glucopyranoside | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| $\begin{array}{l} \textbf{sucrose, alkaline} \\ \beta\text{-D-fructofuranosyl-} \\ \alpha\text{-D-glucopyranoside} \end{array}$ | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | U | S |

M = marginal resistance

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| | | | nor Co. | allini also also allo | 03 | 2 | (0) A. (0) | | No N | 80 W 100 000 | (on | WW - 2001 | 0000 | 000000000000000000000000000000000000000 | Qu | 27 | | Contra Co | õ | O ₂ | LADON CONTRACT | De De C | ton | Company or Many Month | | inot | Page, Main | in oo | 6 | | | St. S | 5 | 20 | No ALCI | 1 |
|--|---------|----------|----------|-----------------------|-------------|------|------------|---------|--|--------------|----------------|-----------|--|---|---------|------------|---------|--|----------|----------------|------------------|-----------------|---------------|-----------------------|-------------|--------------|-------------|-----------------|-----------|-----------|-----------|----------------|------|-----------|---------|-----------|
| Chemicals IUPAC Name | d Cox 3 | CONTO CO | alun: al | Solo elinito | Solo in the | BULO | 1,000 | O THOSE | CD) (SCOL | 1, 00 the | 200 to 200 | My Colin | 1000 - | North | Mon Mon | Dering Co. | PET NOX | POH | DOL WILL | DOLON HONO | oot of the state | Dollow Roy (DD) | ecentro 00 | A HOLOW | Poly in the | POLICIA STOR | Body Chaint | Sol Sol Sol Sol | Signa (1) | Silico AT | Stain, TU | litings of the | Loo. | China tis | C. JHC | Li Corris |
| SOLVENTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| acetone 2-propanone | М | U | S | М | S | U | S | S | S | U | U | М | U | U | S | U | Μ | U | S | S | S | U | U | U | Μ | U | М | S | U | Μ | Μ | S | U | S | U | U |
| acetonitrile ethanenitrile | S | U | S | S | S | U | S | S | U | M | M | S | S | U | S | U | S | U | S | S | S | U | U | U | U | М | М | S | S | S | S | S | U | Х | U | U |
| benzene 🖄 | Μ | U | S | S | S | U | U | М | U | U | U | S | U | U | S | U | S | U | U | U | U | U | U | U | S | U | Μ | S | U | U | Μ | S | U | Х | U | S |
| carbon tetrachloride tetrachloromethane | S | U | S | *** | *** | М | U | S | U | U | U | S | U | U | S | S | S | U | U | U | U | U | S | U | S | U | S | М | U | U | U | 畿 | U | S | U | S |
| chloroform trichloromethane | S | U | S | *** | *** | U | М | S | U | S | S | S | U | U | U | S | S | U | U | U | U | U | U | U | М | U | U | S | U | U | U | 嶽 | U | U | U | U |
| cresol mixture methylphenol | S | U | S | S | S | U | М | S | U | U | U | S | U | U | U | U | S | U | U | U | U | U | U | U | U | U | Х | S | S | U | S | S | U | Х | U | S |
| cyclohexane | S | U | S | S | S | S | U | S | U | S | S | S | U | U | S | S | S | U | U | U | U | U | Μ | U | S | U | S | S | U | U | Μ | М | U | S | U | S |
| diethyl ether ethoxyethane | S | U | S | S | S | U | U | S | U | S S | S ² | S | U | U | S | S | S | U | U | U | U | U | U | U | S | U | S | S | U | S | U | S | U | S | U | U |
| diethyl ketone 3-pentanone | S | U | S | S | Х | U | М | S | М | M | M | Х | U | U | S | U | Х | U | U | U | М | U | U | U | S | U | М | S | Х | U | М | S | U | S | U | U |
| N,N-dimethylformamide N,N-dimethylmethanamide | S | U | S | S | S | М | S | S | М | M | M | S | U | U | S | S | S | U | S | S | S | U | U | U | S | U | Х | S | S | М | S | S | U | Х | U | U |
| dimethyl sulfoxide sulfinylbis[methane] | S | М | S | S | S | U | S | S | S | S | S | S | U | S | S | S | S | U | S | S | S | S | U | U | S | U | Х | S | U | S | S | S | U | х | U | U |
| dioxane 1,4-dioxacyclohexane | S | U | S | М | S | U | М | М | Μ | S | S | S | U | U | S | U | S | U | U | U | S | U | U | U | S | U | Х | S | S | U | S | S | U | Х | U | U |

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| Chemicals IUPAC Name | d Correction | CONT CODOL. | allini det los | alunie (4,000) (00) | 10000 mm 20 | Contraction of the second seco | CO. 11 .00 | Contraction of the second | FD, GO, UNAL | (100000 to 000 | CO TO | W. Colins | 1000 COOOD | Multiple Concerning | Mondon (00 mile | Delin, 66, | AT MOLES | OOL OSCOL | 00.000 00.000 000000 | DOLLETO . | Dound holon | DOLLOW (DOL) | Color of the opposite of the o | or the or of the | Contraction of the second | Dout of all all all all all all all all all al | ed with Being | A CONTRACTION OF THE | Silver C | Silic And | Station Links | It new Us. | N. T. S. | Ling ation | Droop u. | Li. Colorina |
|---------------------------------------|--------------|-------------|----------------|---------------------|-------------|--|------------|---------------------------|--------------|----------------|---|-----------|------------|---------------------|-----------------|------------|----------|-----------|----------------------------|-----------|----------------|--------------|--|--|---------------------------|--|---------------|----------------------|----------|-----------|---------------|------------|--|------------|----------|--------------|
| SOLVENTS (continued) ethanol (50%) | S | U | S | s | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | S | S | М | S | S | S | S | S | S | М | S | М | S | М | S | U | S |
| ethanol (95%) | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S ⁵ | S | S | М | S | S | S | S | S | S | Μ | S | Μ | S | Μ | S | U | S |
| ether | S | U | S | S | S | U | U | S | U | S | S ² | S | U | U | S | S | S | U | U | U | U | S | U | U | S | U | S | S | U | S | М | S | М | S | U | U |
| ethyl acetate ethyl ethanoate | S | U | S | М | S | U | М | S | М | М | М | S1 | U | U | S | U | S | U | U | U | S | U | U | U | S | U | S | S | U | М | М | S | U | S | U | U |
| ethylene gylcol 1,2-ethanediol | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | М | S | S | S | S | S | S | S | S | S | S | М | S | M ⁵ | S | S | S |
| hexane 🖄 | S | S | S | S | S | S | U | S | U | S | S ² | S | S | U | S | S | S | U | U | U | M ¹ | U | S | S | S | U | S | S | U | U | S | S | U | S | U | S |
| isopropyl alcohol 2-propanol | S | U | S | М | S | S | S | S | S | S | S ² | S | М | S | S | S | S | U | S | S | S | М | S | S | S | S | S | S | М | S | Μ | S | Μ | S | S | S |
| kerosene 🖑 | S | S | S | S | S | S | U | S | U | S | S | S | U | XXXX | S | S | S | U | U | U | U | U | S | S | S | S | S | S | U | U | S | S | U | S | U | S |
| methanol 🖑 | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | М | S | М | М | S | S | S | S | S | М | S | М | S | Μ | S | U | М |
| methylene chloride dichloromethane | М | U | S | *** | *** | U | U | S | U | S | S | S | U | U | U | U | S | U | U | U | U | U | U | U | S | U | S | S | U | U | Μ | \$\$ \$ | U | U | U | М |
| methyl ethyl ketone 2-butanone | S | U | S | S | S | U | S | S | S | М | М | S | U | U | S | U | S | U | U | U | S ² | U | U | U | М | U | М | S | U | U | S | S | U | S | U | U |
| phenol (5%) | U | U | S | U | S | U | S | М | Μ | М | Μ | S | U | М | U | Μ | S | U | U | U | S | М | U | U | Μ | U | Х | S | U | U | U | S | М | S | U | S |
| phenol (50%) | U | U | S | U | S | U | U | U | U | U | U | U | U | М | U | U | U | U | U | U | S ² | U | U | U | Μ | U | Х | S | U | U | U | S | М | S | U | S |
| tetrahydrofuran 🖄 | М | U | S | S | S | U | U | U | U | U | U | S | U | U | S | U | S | U | U | U | U | U | U | U | U | U | S | S | U | U | S | S | U | Х | U | U |
| toluene methylbenzene | S | U | S | S | S | U | U | S | U | М | М | S | U | U | S | S | S | U | U | U | U | U | U | U | М | U | М | S | U | U | S | S | U | S | U | S |

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⁷most aluminum components have anodic coating finishes

⁸ avoid high temperatures at high concentrations

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| Chemicals IUPAC Name | d. G. S. | CONICODOLL | alumi of the Car | aline ales des for | 80000 S) | | COO. 11 . (0) | Control of the second s | ED. (Scol) allon | 10000000000000000000000000000000000000 | Cotto (100) | We contraction | 1000-100000000000000000000000000000000 | More of the office offi | oj, October | Dail (G. C.) | AT WAY | Contraction of the second | 00,000 | DOLUTION OF THE TO | DOWN OF A DON | DOLLOD COLODIA | DOLOGIO OLOGIO | DOLLING SOUTH STORE | Constant of the state of the st | DOULENDO, MIC. | B My OB | Child Store Color | City and Co | Silic And | Stein, Tuby | It now us | No. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. | Current Contraction | (Noop up) | Liby Coorde |
|---|--|------------|------------------|--------------------|----------|---|----------------|--|------------------|--|-------------|----------------|--|--|-------------|--------------|--------|---------------------------|--------|--------------------|----------------|----------------|----------------|---------------------|--|----------------|---------|-------------------|-------------|-----------|-------------|-----------|--|---------------------|-----------|-------------|
| SOLVENTS (continued) water | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| xylene mixture dimethylbenzene | S | U | S | S | S | U | M ² | S | U | S | S | S | U | U | S | U | S | U | U | U | M ² | U | U | U | S | U | М | S | U | U | Μ | S | U | S | U | S |
| DETERGENTS Aidex | S | S | S | х | Х | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | Х | S | S | S | S | S | S | S | S | S | S | М | S |
| Alconox | S | S | S | U | U | S | S | S | S | S | S | S | S | S | S | S | S | U | U | U | S | U | S | S | U | S | S | S | S | S | S | S | S | S | М | S |
| Contrad 70 | S | S | Х | Х | Х | S | S | S | S | S | S | Х | S | S | S | Х | S | U | S | М | S | U | S | Х | Х | S | S | S | S | S | Х | Х | S | S | М | S |
| Deconex 13 | S | S | Х | Х | Х | S | S | S | S | S | S | S | S | S | S | Х | S | Х | S | М | S | S | S | Х | S | S | S | S | S | S | Х | Х | S | S | М | S |
| deoxycholate, sodium dodecyl sulfate, Triton X-100 | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | М | S | S | М | S | S | S | S | S | S | S | S | S | S | S |
| Dove | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| Haemo-Sol | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | М | S | М | S | Х | U | S | S | S | S | S | S | S | S | S | S | S |
| IsoClean | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | U | S | М | S | U | S | Х | S | S | S | S | S | S | S | S | S | S | М | S |
| lvory | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| Јоу | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| Liquinox | S | S | Х | Х | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | Х | Х | S | S | М | S |
| LpHse | S | S | Х | Х | Х | S | S | S | S | S | S | S | S | S | S | Х | S | U | S | М | S | U | S | Х | S | S | S | S | S | S | Х | Х | S | S | М | S |
| Solution 555™ (20%) | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | Х | S | S | S | S | S | S | S | S | S | S | S | S |
| Trace Kleen | S | S | Х | Х | Х | S | S | S | S | S | S | S | S | S | S | Х | S | U | S | М | S | U | S | Х | S | S | S | S | S | S | Х | Х | S | S | М | S |

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- ⁵below 21°C only
- ⁶nonaqueous
- ⁷most aluminum components have anodic coating finishes
- ⁸ avoid high temperatures at high concentrations
- ⁹nickel acetate unsatisfactory
- ¹⁰vegetable oils may be marginal or unsatisfactory

| Chemicals IUPAC Name | d Correction of the second sec | Contrologic | allinic lot inter Cor | aline (19,00) | 870000 (S) (S) | Churco Control | CODU IN CODU | Contraction of the second | Flond Color Mallon | (ascience the most | BOAT CONTINUES | WW POSSI | 100, 100, 100, 100, 100, 100, 100, 100, | M. Marson Concernation | Strong (OCADING) | Delin, Op, | PLI MARCH | AOL CON CONTRACTION | Dol. Concerne | DOL OT VICE | DOM CHANGER DAY | DOLOGICAL DOLOGICAL | DON MAN STORES | Contraction of the contraction o | Contraction of the second | DOLLON ON DOLLON | Rede, Choding | A CONTRACTION OF THE | Silver Charles C | Silio (A) (O) | | | 105 (15) | JHO | C JH | Li Coerin |
|--|--|-------------|-----------------------|---------------|----------------|----------------|--------------|---------------------------|--------------------|--------------------|----------------|----------|---|------------------------|------------------|------------|-----------|---------------------|----------------|-------------|-----------------|---------------------|----------------|--|---------------------------|------------------|---------------|----------------------|------------------|---------------|---|---|----------|-----|------|-----------|
| DETERGENTS (continued) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | Ň | 0 | | | |
| Vesphen 11 | S | S | Х | Х | Х | S | S | S | S | S | S | S | S | S | S | Х | S | U | S | М | S | U | S | Х | S | S | S | S | S | S | Х | Х | S | S | М | S |
| Wescodyne | S | S | Х | Х | Х | S | S | S | S | S | S | S | S | S | S | Х | S | U | S | М | S | U | S | Х | S | S | S | S | S | S | Х | Х | S | S | М | S |
| Zephiran chloride (1%) | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | Μ | S | S | S | Х | S | S | S | S | S | S | S | S | U | S | М | S |
| OTHER <i>n</i> -butyl phthalate ⁶ dibutyl 1,2-benzenedicarboxylate | S | U | S | S | S | U | М | S | S | х | S | S | U | U | S | S | S | U | U | U | U | U | U | S | S | U | Х | S | U | М | М | S | U | х | М | S |
| dibutyl phthalate | S | S | S | S | S | U | S | S | S | Х | S | S | U | U | S | S | S | U | U | U | U | U | S | Х | S | U | S | S | U | М | Μ | S | U | S | Х | S |
| deithyl pyrocarbonate pyrocarbonic acid diethyl ester | S | М | S | S | S | U | S | S | Х | S | S | S | S | U | S | S | S | U | S | S | S | U | S | х | U | M1 | S | S | S | S | S | S | S | S | U | S |
| ethylene oxide vapor ⁶ oxirane | Х | S | Х | S | Х | U | S | х | U | U | U | Х | U | Х | S | М | S | S | S | S | S | U | S | х | S | U | S | S | U | U | S | S | S | S | U | U |
| formaldehyde methanol | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | Х | S | S | S | S | S | U | S | U | S | S | S | S | S | S | Μ | S | М | S | S | S |
| formalin (40%) | Х | S | S | S | S | S | S | Х | Х | S | S | S | U | S | S | S | S | S | S | М | S | U | S | U | S | S | S | S | S | М | Μ | S | Μ | S | S | S |
| hydrogen peroxide (3%) | S | S | S | S | U | S | S | S | S | U | U | S | S ² | S | U | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S |
| hydrogen peroxide (10%) | U | S | S | U | S | S | S | U | U | U | U | S | S ² | S | U | S | S | S | S ² | S | S | S | S | S | U | S | S | S | S | S | Μ | S | U | S | S | S |
| 2-mercaptoethanol | S | U | S | S | S | U | S | S | S | М | М | S | U | U | S | U | S | S | S | S | S | S | S | U | U | S | Х | S | U | S | S | S | S | S | U | S |

M = marginal resistance

- U = unsatisfactory resistance
- X = unknown
- Flammability hazard. Not recommended for use in any type of centrifuge because vapors may be ignited by exposure to electrical contacts. Depending on the centrifuge type, such exposure could occur either during normal centrifugation or under failure conditions.

¹ discloloration

²below 26°C only

explosion hazard due to possible material/chemical reaction under rotor failure conditions

⁴dilute solutions satisfactory

⁵below 21°C only

⁶nonaqueous

⁷ most aluminum components have anodic coating finishes

⁸ avoid high temperatures at high concentrations

⁹nickel acetate unsatisfactory

Chemical Resistances for Beckman Coulter Centrifugation Products

| Chemicals IUPAC Name | dCoff. | CONT COON | ellini: Coloriser Co. | alling (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | De la marine o | CO CO CO | CO01, 1,0, | Contraction of the second | FO. COMPLET | Soon Thomas in the soon of the | Cop estimation of the series | M. LOUIS | 1001. Celon | William Control of the Control of th | on Contraction of the | Daily Con | AL WAY | 000000000000000000000000000000000000000 | DOL COTO DOL | DOL WAL | DOL MONTON | A CON COLORIDO | Chore of Show | Control of the Control | DOL TOT OC | DOLUCION CHIOS | Poce Chicking | A CONTRACTION OF THE PARTY OF T | Sim C | Silic And | St. Const. | It's OG OG | 100 the T | (III) (III) (III) (III) | Chilling Control | Li Colin |
|---|--------|-----------------|-----------------------|--|----------------|----------|------------|---------------------------|-------------|--|------------------------------|----------|-------------|--|-----------------------|-----------|--------|---|--------------|---------|------------|----------------|---|------------------------|------------|----------------|---------------|--|-------|-----------|------------|------------|-----------|-------------------------|------------------|----------|
| OTHER (continued) oils (petroleum) | S | S | S | S | х | S | S | S | U | S | S | S | М | S | S | S | S | М | U | S | U | U | S | S | S | S | S | S | М | U | S | S | М | S | S | S |
| oils (other) | S | S ¹⁰ | S | S | S | S | S | S | U | S | S | S | U | S ¹⁰ | S | S | S | М | U | U | S | U | S | S | Х | S | S | S | S | М | S | S | Μ | S | Μ | S |
| physiologic media (e.g., culture media, milk, serum, urine) | S | S | S | М | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | М | S | S | S | S | S |
| sodium hypochlorite (5 1/4% solution; unscented commercial bleach) | U | S | М | U | S | М | S1 | U | S | S | S | S | U | S | U | S | S | S | S | S | M4 | S | S | U | М | S | S | S | S | М | U | S | М | S | S | S |
| Tris buffer (netutral pH) tris (hydroxymethyl) aminomethane | S | S | S | U | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S | S |
| urea | S | S | S | S | S | U | S | S | S | Х | Х | S | S | S | S | S | S | S | S | S | S | S | Μ | Х | S | S | S | S | S | S | Μ | S | S | S | S | S |

S = satisfactory resistance

M = marginal resistance

U = unsatisfactory resistance

X = unknown

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² below 26°C only
² explosion hazard due to possible material/chemical reaction under rotor failure conditions
⁴ dilute solutions satisfactory
⁵ below 21°C only
⁶ nonaqueous
⁷ most aluminum components have anodic coating finishes
⁸ avoid high temperatures at high concentrations
⁹ nickel acetate unsatisfactory
¹⁰ vegetable oils may be marginal or unsatisfactory

GLOSSARY OF TERMS

| anodized coating | a thin, hard layer of aluminum oxide formed electrochemically on aluminum rotor and/or accessory surfaces as a protective coating for corrosion resistance |
|------------------|--|
| Buna N | black nitrile rubber used for O-rings and gaskets in rotor assemblies |
| Delrin | thermoplastic material (acetal homopolymer) used for most tube adapters |
| EPDM | ethylene propylene rubber used for O-rings and pad adapters |
| HDPE | high density polyethylene used for adapters |
| LDPE | low density polyethylene used for tubes and bottles |
| neoprene | black synthetic elastomer used for O-rings in some tube caps and bottle cap assemblies |
| Noryl | modified thermoplastic polyphenylene oxide (PPO) used for floating spacers (part of the g-Max system) and some polycarbonate bottle caps |
| PET | polyethylene terephthalate used in some adapters |
| Radel | polyphenylsulfone (PPS) used in plugs, cap closures, cannisters, and other accessories |
| Ultem | polyetherimide (PEI)—used in adapters, covers, and spacers |
| Viton | fluorocarbon elastomer used in high-temperature applications |