

Gelling Agents

electrophoretic movement of biopolymers is usually toward the anode, EEO can disrupt separations because of internal convection.

Alginate sodium salt

A 0682 from brown algae 100 g
RT (Sodium alginate)
CAS No. 9005-38-3
Low viscosity, Plant cell culture, tested, powder
A straight-chain, hydrophilic, colloidal, polyuronic acid composed primarily of anhydro-β-D-mannuronic acid residues with 1→4 linkage.
Viscosity. approx.250 cP (2% solution, 25 °C) (lit.)
References
1. Adaoha Mbanaso, E.N. and Roscoe, D.H., Alginate: an alternative to agar in plant protoplast culture *Plant Sci. Lett.* **25**, 61-66 (1982)
2. Draget, K.I., et al., Regeneration, cultivation and differentiation of plant protoplasts immobilized in Ca-alginate beads. *J. Plant Physiol.* **132**, 552-556 (1988)
3. Larkin, P.J., et al., Nurse culture of low numbers of *Medicago* and *Nicotiana* protoplasts using calcium alginate beads *Plant Sci.* **58**, 203-210 (1988)
S: 22-24/25

ι-Carrageenan

C 3799 (Irish moss; Gelatin, vegetable) 1 g
RT CAS No. 9062-07-1 25 g
Eucheuma spinosa, Type V
Prepared from a single species to produce essentially pure iota carrageenan. Forms flexible and compliant gels.

Gelrite gellan gum

G 1910 (Agar substitute gelling agent) 250 g
RT CAS No. 71010-52-1 1 kg
Natural gelling agent used to produce clear media for microbiological and other applications. 5 kg

Phytigel™

P 8169 (Agar substitute gelling agent; Gellan gum) 100 g
RT CAS No. 71010-52-1 250 g
Plant cell culture, tested, powder 500 g
An agar substitute produced from a bacterial fermentation composed of glucuronic acid, 1 kg
rhamnose and glucose. It produces a clear, 5 kg
colorless, high strength gel which aids in detection of microbial contamination.
Typical working concentration: 1.5-2.5 g/L in plant tissue culture media; up to 10 g/L in microbiological media. Phytigel™ requires the presence of cations (especially divalent) for gelling to occur. Concentrations of calcium and magnesium contained in most plant tissue culture media are typically sufficient for gelation. Low-salt media formulations, especially those used in microbiological applications, may require supplementation with additional calcium or magnesium salts (e.g., CaCl₂ or MgSO₄) or higher concentrations of Phytigel™.
To prevent clumping, add slowly to rapidly stirring medium prior to heating.
Phytigel is a trademark of Sigma-Aldrich Co.

Transfergel™

T 5660 Plant cell culture, tested 500 g
RT Hydroxyethylcellulose carrier gel for the transfer of somatic embryos and other in vitro propagules from in vitro stages to the soil. Also used for seed drilling of pregerminated seed.

Antibiotics and Antimycotics

Antibiotics

Antibiotic Antimycotic Solution, stabilized (100×)

A 5955 suspension, cell culture, tested 20 mL
-0°C Mode of Action: Penicillin acts by inhibiting 100 mL
bacterial cell-wall synthesis. Streptomycin
DRY ICE inhibits prokaryote protein synthesis by preventing the transition from initiation complex to chain-elongating ribosome and causes miscoding. Amphotericin B interferes with fungal membrane permeability by forming channels in the membranes and causing small molecules to leak out.
Antimicrobial spectrum: Gram-negative bacteria, Gram-positive bacteria, fungi and yeasts.
Solubilized in a proprietary citrate buffer. Formulated to contain 10,000 units/ml penicillin G, 10 mg/ml streptomycin sulfate and 25 µg/ml amphotericin B.
Recommended for use in cell culture applications at 10 mL/L. sterile-filtered
Endotoxin. tested
Color. yellow
References
1. Perlman, D., Jakoby, W. and Pastan I.H., Use of antibiotics in cell culture media, in *Meth. Enzymol.* New York, NY **113**, 112 (1979)
2. Reynolds, J.E.F., ed., *Martindale: The Extra Pharmacopoeia* 31th ed., Great Britain (1996), 181
3. Alberts, B, et al., *Basic Genetic Mechanisms Mol. Biol. Cell.* 3rd ed., (New York, NY (1994), 240
4. Dawson, R.M.C., et al., *Data for Biochemical Research* 3rd ed., New York (1986), 297
5. Reynolds, J.E.F., ed., *Martindale: The Extra Pharmacopoeia* 31th ed., Great Britain (1996), 400
6. *Sigma data*
R: 42 S: 23-26-36/39-45

Carbenicillin disodium salt

C 3416 (α-Carboxybenzylpenicillin disodium salt) 250 mg
2-8°C CAS No. 4800-94-6 1 g
C₁₇H₁₆N₂Na₂O₆S FW 422.4 5 g
Plant cell culture, tested, powder 10 g
Carboxypenicillin antibiotic that inhibits bacterial cell-wall synthesis (peptidoglycan cross-linking) by inactivating transpeptidases on the inner surface of the bacterial cell membrane. Analog to ampicillin.
Antimicrobial spectrum: Gram-positive and Gram-negative bacteria, *Pseudomonas*.
Recommended for antibacterial use in cell culture media at 100 µg/ml. Stable at 37 °C for 3 days.
Hygroscopic powder
Solubility
water.50 mg/mL
Color. white to off-white
Solubility
water. . soluble, solutions are stable 24 hr at room temp, 72 hr at 2-8°C.
alcohol.soluble
R: 42/43 S: 22-36/37-45

Antibiotics and Antimycotics

Antibiotics

Cefotaxime sodium salt

C 7039 (Cefotaxim sodium salt) 100 mg
[2-8°C] CAS No. 64485-93-4 500 mg
 $C_{16}H_{16}N_5O_7S_2Na$ FW 477.5 1 g
Plant cell culture, tested, approx.95%, powder 5 g 10 g
Mode of Action: Inhibits bacterial cell wall synthesis.
Broad spectrum third generation cephalosporin antibiotic.
Color: white to yellow
Solubility
water: soluble, aqueous solutions of pH 4.3-6.2 are stable up to 3 weeks at 2-8 °C.
R: 42/43 S: 22-36/37

Chloramphenicol

C 1919 (Chloromycetin; D(-)-threo-2-Dichloroacetamido-1-(4-nitrophenyl)-1,3-propanediol; D(-)-threo-2,2-Dichloro-N-[β-hydroxy-α-(hydroxymethyl)-β-(4-nitrophenyl)ethyl]acetamide; D-threo-2,2-Dichloro-N-[β-hydroxy-α-(hydroxymethyl)-4-nitrophenethyl]acetamide) 5 g
[RT] 25 g 100 g
 $C_{11}H_{12}Cl_2N_2O_5$ FW 323.1
Plant cell culture, tested
Mode of Action: Inhibits translation on the 50S ribosomal subunit at the peptidyltransferase step (elongation inhibition). Bacteriostatic.
Mode of Resistance: Acetylation by chloramphenicol acetyltransferase (*cat* gene).
R: 45-42/43 S: 53-22-36/37-45

Erythromycin

E 4514 CAS No. 114-07-8 100 g
[RT] $C_{37}H_{67}NO_{13}$ FW 733.9
Plant cell culture, tested, approx.98%
Mode of Action: Inhibits elongation at transpeptidation step.
Antimicrobial spectrum: Gram-negative and Gram-positive bacteria.
Macrolide antibiotic.
R: 42/43 S: 36

G418

G 1279 (G 418 disulfate salt) 250 mg
[2-8°C] CAS No. 108321-42-2 1 g
 $C_{20}H_{40}N_4O_{10} \cdot 2H_2SO_4$ FW 692.7 5 g
Plant cell culture, tested, approx.98% (TLC)
Mode of Action: Blocks polypeptide synthesis and inhibits elongation. For use in the selection and maintenance of eucaryotic cells stably transfected with neomycin resistance genes.
S: 22-24/25

Gentamicin sulfate salt

G 6896 CAS No. 1405-41-0 1 g
[2-8°C] **Plant cell culture, tested** 5 g
Mode of Action: Inhibits protein synthesis by binding to L6 protein of 50S ribosomal subunit.
Antimicrobial spectrum: Gram-negative and Gram-positive bacteria, and mycoplasma.
Potency: approx.600 µg gentamicin per mg
R: 42/43 S: 22-36/37-45

Hygromycin B

H 9773 from *Streptomyces hygrosopicus* 50 mg
[2-8°C] CAS No. 31282-04-9 100 mg
◆ $C_{20}H_{37}N_3O_{13}$ FW 527.5 250 mg
Plant cell culture, tested, minimum50% (HPLC), Lyophilized powder
Mode of Action: Blocks polypeptide synthesis and inhibits elongation. For use in the selection and maintenance of prokaryotic and eukaryotic cells.
Purified by ion-exchange chromatography
R: 26/27/28-41-42/43 S: 22-26-28-36/37/39-45

Kanamycin monosulfate

K 4378 from *Streptomyces kanamyceticus* 5 g
[RT] (Kanamycin sulfate salt; Kanamycin A) 25 g
CAS No. 25389-94-0
 $C_{18}H_{36}N_4O_{11} \cdot H_2SO_4$ FW 582.6
Plant cell culture, tested
Mode of Action: Binds to 70S ribosomal subunit; inhibits translocation; elicits miscoding. Antimicrobial spectrum: Gram-negative and Gram-positive bacteria, and mycoplasma.
Potency: minimum750 µg per mg
kanamycin B. <5%

Neomycin trisulfate salt hydrate

N 3144 CAS No. 1405-10-3 100 g
[RT] $C_{23}H_{46}N_6O_{13} \cdot 3H_2SO_4 \cdot xH_2O$ FW 908.9
Plant cell culture, tested
R: 42/43 S: 22-36/37-45

Paromomycin sulfate salt

P 8692 CAS No. 1263-89-4 5 g
[RT] $C_{23}H_{45}N_5O_{14}$ FW 713.7 25 g
Plant cell culture, tested
Antimicrobial spectrum: Gram-negative and Gram-positive bacteria, some protozoan species, and limited antihelminth.
Mode of Action: Inhibits initiation and elongation during protein synthesis.
R: 61-36/37/38 S: 53-26-36-45

Penicillin G

R: 42/43 S: 22-36/37

P 8306 **Penicillin G potassium salt** 100000000 units
[RT] (Benzylpenicillin potassium salt)
CAS No. 113-98-4
 $C_{16}H_{17}KN_2O_4S$ FW 372.5
Plant cell culture, tested, approx.1,600 units/mg
Mode of Action: Inhibits bacterial cell wall synthesis.
Antimicrobial spectrum: Gram-positive bacteria

P 8431 **Penicillin G sodium salt** 100000000 units
[RT] (Benzylpenicillin sodium salt)
CAS No. 69-57-8
 $C_{16}H_{17}N_2O_4SNa$ FW 356.4
Plant cell culture, tested, approx.1,650 units/mg
Mode of Action: Inhibits bacterial cell wall synthesis.
Antimicrobial spectrum: Gram-positive bacteria.

Antibiotics and Antimycotics

Antibiotics

Puromycin dihydrochloride

P 8833 from *Streptomyces albo-niger* 10 mg
[−0°C] (3'-[α-Amino-p-methoxyhydrocinnamido]-3'-deoxy-N,N-dimethyladenosine dihydrochloride) 25 mg
CAS No. 58-58-2 100 mg
 $C_{22}H_{29}N_7O_5 \cdot 2HCl$ FW 544.4
powder, ≥98% (TLC), cell culture, tested
Nucleoside antibiotic. Protein synthesis inhibitor that causes premature chain termination by acting as an analog of the 3' terminal end of aminoacyl-tRNA. Prevents growth of bacteria, protozoa, algae and mammalian cells. Acts very quickly and can kill 99% of cells within 2 days, the resistance gene (puromycin acetyltransferase) gives very effective protection. Recommended for use as a selection agent at a range of 10-100 µg/ml.
Streptomyces sp.
Solubility
water. . . 50 mg/mL, Sterilize stock solution by filtration using 0.22µm filter then store in aliquots at −20°C.
R: 23/24/25-36/37/38 S: 22-26-36-45

8-Quinololinol hemisulfate salt

H 3649 (8-Hydroxyquinoline hemisulfate salt) 100 g
[RT] CAS No. 134-31-6
 $C_9H_7NO \cdot H_2SO_4$ FW 388.4
Plant cell culture, tested, crystalline
Color. light yellow
R: 22 S: 36

Rifampicin

R 7382 (Rifamycin AMP; 3-(4-Methylpiperazinyliminomethyl)rifamycin SV; Rifampin) 1 g
[−0°C] 5 g
CAS No. 13292-46-1
 $C_{43}H_{58}N_4O_{12}$ FW 823.0
Plant cell culture, tested, approx.95% (HPLC), crystalline
Mode of Action: Inhibits initiation of RNA synthesis by binding to β-subunit of RNA polymerase.
Inhibits the assembly of DNA and protein into mature virus particles.
References
1. *Proc. Nat. Acad. Sci. USA* **61**, 667 (1968)
2. *Proc. Nat. Acad. Sci. USA* **63**, 1327 (1969)
3. *Biochim. Biophys. Acta* **157**, 215 (1968)
4. *Nature* **224**, 1280 (1969)
R: 22-62-63 S: 22-36/37

Spectinomycin dihydrochloride hydrate

S 9007 CAS No. 21736-83-4 5 g
[−2-8°C] $C_{14}H_{24}N_2O_7 \cdot 2HCl$ FW 405.3 25 g
Mode of Action: Inhibits protein synthesis (elongation) by interfering with peptidyl tRNA translocation.
Antimicrobial spectrum: Gram-negative and Gram-positive bacteria (Gonococcus only).
Mode of Resistance: Mutation in *rpsE* (the gene for ribosomal protein S5) prevents binding of spectinomycin.
S: 22-24/25

Streptomycin sulfate salt

S 0774 CAS No. 3810-74-0 25 g
[−2-8°C] $(C_{21}H_{39}N_7O_{12})_2 \cdot 3H_2SO_4$ FW 1457 100 g
Plant cell culture, tested
Mode of Action: Inhibits protein synthesis. Binds to S12 protein of 30S ribosomal subunit, causing misreading or inhibiting initiation.
Mode of Resistance: Mutation in *rpsL* (gene for S12 ribosomal protein) prevents binding of streptomycin to ribosome. Aminoglycoside phosphotransferase also inactivates.
R: 22

Vancomycin hydrochloride

V 1130 from *Streptomyces orientalis* 1 g
[−2-8°C] (Vancocin hydrochloride) 5 g
CAS No. 1404-93-9
 $C_{66}H_{75}Cl_2N_9O_{24} \cdot HCl$ FW 1485
Plant cell culture, tested
Mode of Action: Interfers with cell wall synthesis.
Antimicrobial spectrum: Gram-positive bacteria.
Glycopeptide antibiotic.
Potency: approx.1,000 µg per mg
R: 43 S: 22-24/25

Antimycotics

Amphotericin B

A 6804 from *Streptomyces* sp. 100 mg
[−2-8°C] (Fungizone) 500 mg
CAS No. 1397-89-3 1 g
 $C_{47}H_{73}NO_{17}$ FW 924.1
Plant cell culture, tested, approx.80% (HPLC), powder
Polyene antifungal antibiotic from *Streptomyces*. Affinity for sterols, primarily ergosterols, of fungal cell membranes. Forms channels in the membranes, causing small molecules to leak out.
Antimicrobial spectrum: fungi and yeast.
Recommended for antifungal use in cell culture media at 2.5 mg/L. Stable at 37 °C for 3 days.
Solubility
dimethylformamide:1 M hydrochloric acid (3:1). may be clear to slightly hazy.
References
Perlman, D., Use of antibiotics in cell culture media. *Meth. Enzymol.* **LVIII**, 112 (1979)
R: 36/37/38 S: 22-26-36

Nystatin

N 9767 (Mycostatin; Fungicidin) 5000000 units
[−0°C] 25000000 units
Plant cell culture, tested
Mode of Action: Increases the permeability of the cell membrane of sensitive fungi by binding to sterols.
Antimicrobial spectrum: Yeasts and molds.
Minimum 5000 USP units/mg.
References
Brezis, M., *Science* **224**, 66 (1984)
S: 22-24/25

Pentachloronitrobenzene

P 8556 (Quintozene; PCNB) 100 g
[RT] CAS No. 82-68-8
 $C_6Cl_5NO_2$ FW 295.3
Plant cell culture, tested, 99% (GC), powder
Color. yellow to tan
R: 43 S: 24-37

Thiabendazole

T 5535 (2-(4-Thiazolyl)benzimidazole) 50 g
[RT] CAS No. 148-79-8
 $C_{10}H_7N_3S$ FW 201.3
Plant cell culture, tested, powder
Color. light yellow
R: 50/53 S: 60-61

