Certificate of Analysis & Product Manual

Electrophoresis Reagents, Polymerase Chain Reaction
Custom Primers and Probes
Hybridization and Detection Reagents

DNA & RNA Precipitation Solutions Pack

Catalog No. 40-5130-00

Storage Condition: See Material Supplied List

For Research Use Only. Not for use in diagnostic procedures for clinical purposes

20 years
results you can rely on
Gene Link™

Material Supplied

	Description	Catalog No.	Size
☐	DNA & RNA Precipitation Solutions Pack	40-5130-00	1 Pack

Storage Condition:
Store glycogen and linear acrylamide solutions upon receipt **at -20°C** and all other solutions at room temperature.

DNA & RNA Precipitation Solutions Pack

Content	Catalog No.	Product	Size
☐	40-5112-01	Glycogen Solution, 10 mg/mL; 1 mL	1 mL
☐	40-5113-01	Linear Acrylamide Solution (Linear polyacrylamide, LPA; 5 mg/mL); 1 mL	1 mL
☐	40-5131-05	LiCl RNA Precipitation Solution (7.5M LiCl, 50 mM EDTA pH 8.0); 50 mL	50 mL
☐	40-5132-05	Sodium Acetate 3M pH 5.5; DNA & RNA Precipitation Solution; 50 mL	50 mL
☐	40-5134-05	Sodium Chloride 5M; DNA & RNA Precipitation Solution; 50 mL	50 mL
☐	40-5135-05	Ammonium Acetate 7.5M; DNA & RNA Precipitation Solution; 50 mL	50 mL

Certificate of Analysis & Product Specifications

DNA & RNA precipitation solutions are a basic requirement for all molecular biology laboratories. Gene Link prepared a collection of common and popular solutions using nuclease free water and all are molecular biology grade and suitable for RNA precipitation as well.

Glycogen and Linear Acrylamide solutions are prepared using nuclease free water and tested for absence of nuclease by using these in RNA and DNA precipitation followed by agarose gel electrophoresis to determine integrity and no breakdown of nucleic acids.
Appropriate molarity solutions of LiCl, sodium acetate, potassium acetate and sodium chloride are prepared in nuclease free autoclaved water and autoclaved again after preparation. Ammonium acetate solutions of appropriate molarity are prepared in nuclease free autoclaved water. All solutions are tested for DNA, RNA and oligonucleotide precipitation.
All solutions are certified to be free of nucleases and nucleic acids and validated for DNA and RNA precipitation. Appropriate nuclease free handling, dispensing and storage conditions required.

Manufacturing lot numbers are stated on the label of each product and accompanying packing slip.

	DNA & RNA Precipitation Solutions		
REF	Storage	Catalog No.	**Product**
	-20°C to -10°C	40-5112-01	Glycogen Solution, 10 mg/mL; 1 mL
	-20°C to -10°C	40-5113-01	Linear Acrylamide Solution (Linear polyacrylamide, LPA; 5mg/mL); 1 mL
	15°C to 25°C	40-5131-05	LiCl RNA Precipitation Solution (7.5M LiCl, 50 mM EDTA pH 8.0); 50 mL
	15°C to 25°C	40-5132-05	Sodium Acetate 3M pH 5.5; DNA & RNA Precipitation Solution; 50 mL
	15°C to 25°C	40-5133-05	Potassium Acetate 3M pH 5.5; DNA & RNA Precipitation Solution; 50 mL
	15°C to 25°C	40-5134-05	Sodium Chloride 5M; DNA & RNA Precipitation Solution; 50 mL
	15°C to 25°C	40-5135-05	Ammonium Acetate 7.5M; DNA & RNA Precipitation Solution; 50 mL
	15°C to 25°C	40-5136-05	Ammonium Acetate 5M; DNA & RNA Precipitation Solution; 50 mL

RUO Research Use Only		LOT
Research Use Only	**Storage** See table above	**Lot Number** Stated on product tube and packing slip
		
Expiry 6 months from ship date	**Instructions** Consult product description	**QR Code** Visit Gene Link website for product details

Product Description & Application

Precipitation of DNA & RNA

A classic molecular biology procedure is ethanol precipitation to concentrate DNA, RNA and oligonucleotides. A variation is the use of isopropanol. This product manual is limited to description related to alcohol precipitation of nucleic acids. Another method of concentrating DNA and RNA is the use of silica beads or glass fiber filters to preferentially bind DNA and RNA in the presence of chaotropic salts. See Omni-Clean™ product line for details of this method. Omni-Clean™ is an effective method for concentrating DNA & RNA from very dilute solutions and extraction of DNA & RNA from gel slices.

DNA and RNA precipitation using alcohol is based on the principle of salting out in the presence of salts that renders nucleic acids preferentially to become insoluble and the precipitate is collected by centrifugation. The process also purifies the DNA & RNA leaving alcohol soluble salts, organic solvents and detergents.

The backbone of DNA & RNA is negatively charged due to the phosphate groups of the phosphodiester linkages and is thus hydrated and readily soluble in neutral water. Addition of cationic salts and ethanol or isopropanol disrupts the hydrate shell and promotes ionic bond formation between the negatively charged phosphate groups and positively charged ions effectively neutralization of the DNA or RNA molecule leading to precipitation.

Ethanol versus Isopropanol

Ethanol and isopropanol are both used for precipitation of nucleic acids. Ethanol is used at 2 volumes for DNA and 2.5 -3 volumes for RNA and isopropanol at 0.6 to 1 volume of DNA and RNA solutions. The final concentration of ethanol varies from 60%-80% and 30%-50% for isopropanol.

Isopropanol has the advantage of requiring less volume and is typically used when precipitating large volumes of nucleic acid solutions. Typically, 0.6 to 1 volume of isopropanol is added to 1 volume of DNA solution. The higher amount is useful for smaller RNA fragments. In contrast, 2 volumes of ethanol is standard for DNA and 2.5 volumes for RNA solutions. However, isopropanol has the disadvantage of co precipitating more salts and is less volatile compared to ethanol and is slow to air dry increasing the risk of alcohol carry-over into the final sample.

Carriers /Coprecipitants

DNA and RNA are quite effectively precipitated at a concentration of 100-200 ng/mL by standard ethanol precipitation and usually a pellet is also visible at this concentration. Quantitative precipitation is usually not achieved below 100 ng/mL in addition a pellet is not visible thus making it difficult to accomplish ethanol precipitation.

Traditionally tRNA and glycogen were used as carrier to aid precipitation and visibility of the pellet. Both of these are from biological sources and thus contain traces of nucleic acids and their use requires extensive removal of nucleic acids and nucleases. Linear poly acrylamide (LPA) is a synthetic inert carrier and thus free of nucleic acids and nucleases.
Glycogen and linear acrylamide (LPA) both have minimal inhibitory effect on most molecular biology applications and thus can be used quite confidently.

Salts

Most common salts used in ethanol precipitations are sodium acetate, ammonium acetate, sodium chloride and lithium chloride.
3M sodium acetate pH of 5.2-5.5 solution is the standard reagent for nucleic acid precipitation in most laboratories.

Frequently used salts are listed below with some attributes.

Salt	Stock	Final Molarity	Attributes
Sodium acetate	3M, pH 5.5	0.3M	Precipitates proteins so should be avoided if solution contains high amount of protein.
Sodium Chloride	3M or 5M	0.2-0.3M	Preferred salt in high detergent content solutions. SDS remains soluble in 70% ethanol and ensures detergent free DNA precipitation.
Ammonium Acetate	7.5M	2.5M	Preferred salt in high dNTP's and oligosaccharides content solutions as these remain in solution. Avoid using if kinasing as ammonium ions inhibit polynucleotide kinase.
Potassium Acetate	3M, pH 5.5	0.3M	1. Potassium acetate is particularly useful in the precipitation of RNA for cell-free translation as it avoids the addition of sodium ions. 2. Precipitates proteins so should be avoided if solution contains high amount of protein. 3. Avoid using with DNA and RNA solutions containing SDS. Potassium salt of SDS is very insoluble.
Lithium Chloride	7.5M	2.5M	Useful in precipitation of RNA 300 nucleotides and above without ethanol precipitation. Avoid if downstream application involves translation. Ethanol precipitation will precipitate DNA, RNA, oligos and proteins.

Common Contaminant and Recommended Salt Usage		
Contaminant	**Salt**	**Recommended Protocol**
High Protein	Ammonium acetate 2.5M precipitates proteins in the absence of ethanol while DNA remain in solution	Use ammonium acetate 2.5M final concentration and without adding ethanol centrifuge at 12 K rpm for 10 minutes. Proteins should be precipitated. Decant solution to fresh tube and proceed with ethanol precipitation.
High Carbohydrate and high dNTP	Ammonium acetate 2.5M with ethanol precipitates DNA while carbohydrates and dNTP's remain in solution	Follow standard ethanol precipitation procedure with 70% ethanol wash after precipitation.
High Detergent	Sodium chloride 0.2M. Detergents including SDS remain in solution in 0.2M sodium chloride- 65-70% ethanol solution.	Follow standard ethanol precipitation procedure with 70% ethanol wash after precipitation.

Chilling Temperature & Time

Classic chilling temperature is -20°C for 10-15 minutes, this may be preferred when the DNA concentration is lower than 100 ng but usually not necessary as precipitation occurs very rapidly when DNA concentration is not limiting.

Precipitation chilling time varies amongst different laboratories from –70°C, -20°C, 0°C, or room temperature for periods of 5 min to overnight. For low DNA concentrations longer centrifugation times of up to 20 minutes may be required for efficient recovery.
At the lower temperatures, the viscosity of the alcohol is greatly increased and centrifugation for longer times may be required to effectively pellet the precipitated DNA. The efficiency of precipitation for small concentrations or amounts of DNA may be increased by incubation at –70°C, but these solutions should be brought to 0°C before centrifugation.

Centrifugation Speed & Time

Generally centrifugation at 12K rpm for 5-10 minutes is sufficient for DNA and RNA precipitation. Longer spin time is effective in recovery of low concentration of nucleic acids but increasing beyond 20 minutes is not usually necessary.

Drying

Care should be observed in drying the precipitated DNA and RNA to completely evaporate the ethanol or isopropanol before reconstitution. Nucleic acids should not be over dried and speedvac with heat should be avoided or performed for an observed short duration sufficient to evaporate the alcohol. Usually leaving the tubes open on the bench for a few minutes is sufficient.

Precipitation of RNA

RNA precipitation is generally similar to DNA while special consideration should be given to RNase free handling and performance of all methods.

Preferred RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) [Catalog no.: 40-5014-16]

Reconstitution

See Gene Link DNA & RNA Reconstitution solutions [Catalog No.; 40-3000-00] manual.

DNA & RNA Reconstitution Solutions Pack Content
Catalog No.: 40-5014-05 RNA Reconstitution Solution (1 mM Sodium Citrate pH 6.4); 50 mL
Catalog No.: 40-3000-05 DEPC Treated Water; 50 mL
Catalog No.: 40-3001-05 Nuclease Free Water (DEPC Free); 50 mL
Catalog No.: 40-5011-05 TE Buffer 1X solution pH 7.0; 50 mL

Carrier/Coprecipitant

Glycogen [CAS: 9005-79-2]

Glycogen Solution 10 mg/mL; Catalog No.: 40-5112-01

Effective DNA and RNA precipitation with the use of monovalent salts and ethanol or isopropanol is dependent on its concentration. DNA and specifically RNA precipitation at a concentration of less than 50 ng/mL is usually not quantitative and the pellet is not clearly visible leading to unreliable recovery.

Addition of glycogen or linear acrylamide as a carrier/coprecipitant aids in quantitative recovery and specifically clear visibility pf the pellet. Glycogen does not interfere with spectrophotometric readings, electrophoresis, and most molecular biology enzymatic applications including PCR.

Usage: 1 µL (10 µg) of 10mg/mL glycogen solution is adequate for 500 µL DNA or RNA solution.

Glycogen origin: Glycogen is a highly purified polysaccharide derived from oysters.

Specification: Molecular biology grade. Glycogen solution supplied is validated DNase and RNase free. Glycogen solution may contain remnant nucleic acids.

Linear Acrylamide

Linear Acrylamide Solution (Linear polyacrylamide, LPA; 5mg/mL); Catalog No.: 40-5113-01

Effective DNA and RNA precipitation with the use of monovalent salts and ethanol or isopropanol is dependent on its concentration. DNA and specifically RNA precipitation at a concentration of less than 50 ng/mL is usually not quantitative and the pellet is not clearly visible leading to unreliable recovery.

Addition of linear acrylamide as a carrier/coprecipitant aids in quantitative recovery and specifically clear visibility pf the pellet. Linear acrylamide does not interfere with spectrophotometric readings, electrophoresis, and most molecular biology enzymatic applications including PCR. Linear acrylamide is prepared synthetically and is guaranteed free of all nucleic acids, DNase, RNase and proteases. The average molecular mass of linear polyacrylamide [40-5113-01] is 9-13 MDa.

Usage: 1 -2µL (5-10 µg) of 5mg/mL Linear acrylamide (LPA) solution is adequate for 500 µL DNA or RNA solution. Linear polyacrylamide pellet does not stick tightly on the bottom of microfuge tube. Be careful not to discard pellet when you remove supernatant.

Linear acrylamide (LPA) solution origin: Synthetic prepared in nuclease free molecular biology grade water.

Specification: Molecular biology grade. Linear acrylamide (LPA) solution supplied is validated DNase, RNase, protease and nucleic acid free. The average molecular mass of linear polyacrylamide [40-5113-01] is 9-13 MDa.

Sodium Acetate [CAS: 127-09-3]

3M Sodium Acetate pH 5.5 DNA & RNA Precipitation Solution; Catalog No.: 40-5132-05

Sodium Acetate precipitates proteins so should be avoided if solution contains high amount of protein.

Usage: 0.3 M Sodium Acetate final concentration and 2 to 2.5 volume ethanol.
Routine precipitation of DNA or RNA at Concentrations ≥20 ng/mL

1. Add 1/10th volume of 3 M Sodium Acetate pH 5.5.
2. Add 2 volumes of 100% ethanol for DNA or 2.5 volumes of 100% ethanol for RNA.
3. Incubate at -20°C for 30 minutes.
4. Centrifuge at 12 K rpm for a minimum of 10 minutes at 4°C. Decant gently or aspirate supernatant.
5. To the pellet add 200 µL 70% ethanol stored at -20°C. Vortex.
6. Centrifuge at 12 K rpm for a minimum of 3 minutes at 4°C. Decant gently or aspirate supernatant.
7. Air dry pellet for 5 minutes.
8. Resuspend pellet in nuclease free water or TE (10 mM Tris pH 7.5, 1 mM EDTA).
9. Preferred RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) [Catalog no.: 40-5014-16]

Potassium Acetate [CAS: 127-08-2]

3M Potassium Acetate pH 5.5 DNA & RNA Precipitation Solution; Catalog No.: 40-5133-50

1. Potassium acetate is particularly useful in the precipitation of RNA for cell-free translation as it avoids the addition of sodium ions.
2. Precipitates proteins so should be avoided if solution contains high amount of protein.
3. Avoid using with DNA and RNA solutions containing SDS. Potassium salt of SDS is very insoluble.

Usage: 0.3 M Potassium Acetate final concentration and 2 to 2.5 volume ethanol.
Routine precipitation of DNA or RNA at Concentrations ≥20 ng/mL

1. Add 1/10th volume of 3 M Potassium Acetate pH 5.5.
2. Add 2 volumes of 100% ethanol for DNA or 2.5 volumes of 100% ethanol for RNA.
3. Incubate at -20°C for 30 minutes.
4. Centrifuge at 12 K rpm for a minimum of 10 minutes at 4°C. Decant gently or aspirate supernatant.
5. To the pellet add 200 µL 70% ethanol stored at -20°C. Vortex.
6. Centrifuge at 12 K rpm for a minimum of 3 minutes at 4°C. Decant gently or aspirate supernatant.
7. Air dry pellet for 5 minutes.
8. Resuspend pellet in nuclease free water or TE (10 mM Tris pH 7.5, 1 mM EDTA).
9. Preferred RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) [Catalog no.: 40-5014-16]

Sodium Chloride [CAS:7647-14-5]

5M Sodium Chloride DNA & RNA Precipitation; Catalog No.: 40-5134-05

1. Adjusting the pH is not required.
2. Preferred salt in high detergent content solutions. SDS remains soluble in 70% ethanol and ensures detergent free DNA precipitation.

Usage: 0.3 M Sodium Chloride final concentration and 2 to 2.5 volume ethanol
Routine precipitation of DNA or RNA at Concentrations ≥500 ng/mL

1. Add 5M Sodium Chloride to a final concentration of 0.3M.
2. Add 2 volumes of 100% ethanol for DNA or 2.5 volumes of 100% ethanol for RNA.
3. Incubate at -20°C for 30 minutes.
4. Centrifuge at 12 K rpm for a minimum of 15 minutes at 4°C. Decant gently or aspirate supernatant.
5. To the pellet add 200 µL 70% ethanol stored at -20°C. Vortex.
6. Centrifuge at 12 K rpm for a minimum of 3 minutes at 4°C. Decant gently or aspirate supernatant.
7. Air dry pellet for 5 minutes.
8. Resuspend pellet in nuclease free water or TE (10 mM Tris pH 7.5, 1 mM EDTA)
9. Preferred RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) [Catalog no.: 40-5014-16]

Ammonium Acetate [CAS: 631-61-8]

7.5M Ammonium Acetate DNA & RNA Precipitation Solution; Catalog No.: 40-5135-05

1. Volatile solution, do not autoclave.
2. Preferred salt in high dNTP's and oligosaccharides content solutions as these remain in solution.
3. Avoid using if kinasing as ammonium ions inhibit polynucleotide kinase.
4. Ammonium acetate 2.5M with ethanol precipitates DNA while carbohydrates and dNTP's remain in solution.

Usage: 2.5 M Ammonium Acetate final concentration and 2.5 volume ethanol for RNA
Routine precipitation of DNA or RNA at Concentrations ≥20 ng/mL

1. Add 0.5 volume of 7.5 M Ammonium Acetate. Vortex.
2. Add 2 volumes of 100% ethanol for DNA or 2.5 volumes of 100% ethanol for RNA.
3. Incubate at -20°C for 30 minutes.
4. Centrifuge at 12 K rpm for a minimum of 15 minutes at 4°C. Decant gently or aspirate supernatant.
5. To the pellet add 200 µL 70% ethanol stored at -20°C. Vortex.
6. Centrifuge at 12 K rpm for a minimum of 3 minutes at 4°C. Decant gently or aspirate supernatant.
7. Air dry pellet for 5 minutes.
8. Resuspend pellet in nuclease free water or TE (10 mM Tris pH 7.5, 1 mM EDTA).
9. Preferred RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) [Catalog no.: 40-5014-16]

Ammonium Acetate

5M Ammonium Acetate DNA & RNA Precipitation Solution; Catalog No.: 40-5136-05

1. Volatile solution, do not autoclave.
2. Preferred salt in high dNTP's and oligosaccharides content solutions as these remain in solution.
3. Avoid using if kinasing as ammonium ions inhibit polynucleotide kinase.
4. Ammonium acetate 2.5M with ethanol precipitates DNA while carbohydrates and dNTP's remain in solution.

Usage: 2.5 M Ammonium Acetate final concentration and 2.5 volume ethanol for RNA
Routine precipitation of DNA or RNA at Concentrations ≥20 ng/mL

1. Add 1 volume of 5 M Ammonium Acetate. Vortex.
2. Add 2 volumes of 100% ethanol for DNA or 2.5 volumes of 100% ethanol for RNA.
3. Incubate at -20°C for 30 minutes.
4. Centrifuge at 12 K rpm for a minimum of 15 minutes at 4°C. Decant gently or aspirate supernatant.
5. To the pellet add 200 µL 70% ethanol stored at -20°C. Vortex.
6. Centrifuge at 12 K rpm for a minimum of 3 minutes at 4°C. Decant gently or aspirate supernatant.
7. Air dry pellet for 5 minutes.
8. Resuspend pellet in nuclease free water or TE (10 mM Tris pH 7.5, 1 mM EDTA)
9. Preferred RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) [Catalog no.: 40-5014-16]

LiCl RNA Precipitation Solution

(7.5M LiCl, 50 mM EDTA pH 8.0); Catalog No.: 40-5131-05

Do not use for precipitation of RNA smaller than 300 nucleotides.

A final concentration of 2.5M LiCl is effective in precipitation of RNA larger than 300 nucleotides without the addition of ethanol, this method of precipitation selectively precipitates RNA and does not efficiently precipitate DNA, protein or carbohydrate (Barlow et al., 1963). It is the method of choice for removing inhibitors of translation or cDNA synthesis from RNA preparations (Cathala et al., 1983). It also provides a simple rapid method for recovering RNA from in vitro transcription reactions. As little as 50 ng of RNA can be quantitatively recovered by centrifugation at 12K rpm for 20 minutes at 4°C.

Usage: 2.5M Lithium Chloride final concentration without addition of ethanol or isopropanol.
Routine precipitation of RNA at Concentrations ≥100 ng/mL.

1. Add 0.5 volume of 7.5 M LiCl. (Do not add ethanol)
2. Incubate at -20°C for 30 minutes.
3. Centrifuge at 12 K rpm for a minimum of 15 minutes at 4°C. Decant gently or aspirate supernatant.
4. To the pellet add 200 µL 70% ethanol stored at -20°C. Vortex.
5. Centrifuge at 12 K rpm for a minimum of 3 minutes at 4°C. Decant gently or aspirate supernatant.
6. Air dry pellet for 5 minutes.
7. Resuspend pellet in nuclease free water or TE (10 mM Tris pH 7.5, 1 mM EDTA) or 1 mM Sodium Citrate pH 6.4.
8. Preferred RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) [Catalog no.: 40-5014-16]

References

1. Okayama, H. & Berg, P. (1982) *Mol. Cell. Biol.* **2**, 161-170, High-efficiency cloning of full-length cDNA.
2. Wallace, D.M. (1987) *Methods Enzymol.* **152**, 41-48, Precipitation of nucleic acids.
3. Ausubel, F.A., Brent, R., Kingston, R.E., Moore, D.D., Seidman, J.G., Smith, J.A. & Struhl, K. (eds.) (1995) *Current Protocols in Molecular Biology,* Pages 15.3.1-4 (Suppl. 17) Greene Publishing & Wiley-Interscience, New York.
4. Saporito-Irwin, S.M. *et al*. (1997) *BioTechniques* **23**, 424-427, Protocol for the preparation of plasmid DNA, suitable for the transfection of mammalian cells.
5. Gaillard, C, and F Strauss. "Ethanol precipitation of DNA with linear polyacrylamide as carrier." *Nucleic Acids Research* 18, no. 2 (Jan 1990): 378.
6. Barlow, J J, A P Mathias, R Williamson, and D B Gammack. " A Simple Method for the Quantitative Isolation of Undegraded High Molecular Weight Ribonucleic Acid." *Biochem. Biophys. Res. Commun.* 13 (1963): 61-66.
7. Cathala, G, et al. "A Method for Isolation of Intact, Translationally Active Ribonucleic Acid." *DNA* 2 (1983): 329-335.

Ordering Information

DNA & RNA Precipitation Solutions

Product	Catalog No.	Unit Size
DNA & RNA Precipitation Solutions Pack (Contains the following; Glycogen Solution 10 mg/mL; 1 mL [40-5112-01]; Linear Acrylamide Solution 5mg/mL; 1 mL [40-5113-01] LiCl RNA Precipitation Solution [40-5131-05]; Sodium Acetate DNA & RNA Precipitation Solution [40-5132-05]; Sodium Chloride DNA & RNA Precipitation [40-5134-05] and Ammonium Acetate 7.5M DNA & RNA Precipitation Solution [40-4135-05])	40-5130-00	1 Pack
Glycogen Solution 10 mg/mL; 1 mL	40-5112-01	1 mL
Linear Acrylamide Solution (Linear polyacrylamide, LPA; 5mg/mL); 1 mL	40-5113-01	1 mL
LiCl RNA Precipitation Solution (7.5M LiCl, 50 mM EDTA pH 8.0); 50 mL	40-5131-05	50 mL
Sodium Acetate 3M pH 5.5; DNA & RNA Precipitation Solution; 50 mL	40-5132-05	50 mL
Potassium Acetate 3M pH 5.5; DNA & RNA Precipitation Solution; 50 mL	40-5133-05	50 mL
Sodium Chloride 5M DNA & RNA Precipitation; 50 mL	40-5134-05	50 mL
Ammonium Acetate 7.5M DNA & RNA Precipitation Solution; 50 mL	40-5135-05	50 mL
Ammonium Acetate 5 M DNA & RNA Precipitation Solution; 50 mL	40-5136-05	50 mL

Related Products Ordering Information

DNA & RNA Reconstitution Solutions

Product	Catalog No.	Unit Size
DNA & RNA Reconstitution Solutions Pack (contains 50 mL each of DEPC Treated Water [40-3000-05], Nuclease Free Water (DEPC Free) [40-3001-05], TE pH 7.0 [40-5011-05] and RNA Reconstitution Solution [40-5014-05)	40-3000-00	1 Pack
RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4;) 10 X 1.6 mL	40-5014-16	10 X 1.6 mL
RNA Reconstitution & Storage Solution (1 mM Sodium Citrate pH 6.4); 50 mL	40-5014-05	50 mL
TE Buffer 1X solution pH 7.0; 50 mL	40-5011-05	50 mL
TE Buffer 1X solution pH 7.5; 50 mL	40-5012-05	50 mL
TE Buffer 1X solution pH 8.0; 50 mL	40-5013-05	50 mL
Nuclease Free Water (DEPC Free); 10 X 1.6 mL	40-3001-16	10 X 1.6 mL
Nuclease Free Water (DEPC Free;) 50 mL	40-3001-05	50 mL
Nuclease Free Water (DEPC Free); 500 mL	40-3001-50	500 mL
Nuclease Free Water (DEPC Free); 1L	40-3001-01	1 L
DEPC Treated Water; 10 X 1.6 mL	40-3000-16	10 X 1.6 mL
DEPC Treated Water; 50 mL	40-3000-05	50 mL
DEPC Treated Water; 500 mL	40-3000-50	500 mL
DEPC Treated Water; 1L	40-3000-01	1 L

Related Products Ordering Information

PCR Additives & Reagents		
Product	**Catalog No.**	**Unit Size**
Taq DNA Polymerase 300 units; 5 µ/µL; 60 µL	40-5200-30	300 units
PCR Buffer Standard (10 X); 1.6 mL	40-3060-16	1.6 mL
PCR Buffer Mg Free (10 X); 1.6 mL	40-3061-16	1.6 mL
Taq Polymerase Dilution Buffer; 1 mL	40-3070-10	1 mL
dNTP 2mM (10X); 1.1 mL	40-3021-11	1.1 mL
$MgCl_2$; 25 mM; 1.6 mL	40-3022-16	1.6 mL
Omni-Marker™ Universal Unlabeled; 1 mL	40-3005-10	1 mL
Primer and Template Mix; 500 bp; 40 reactions	40-2026-60PT	100 µL
Nuclease Free Water, 10 X 1.6 mL	40-3001-16	10 X 1.6 mL
DMSO, 1 mL	40-3031-10	1 mL
TMAC (Tetramethyl ammonium chloride) 100 mM; 1 mL	40-3053-10	1 mL
KCl 300 mM; 1 mL	40-3059-10	1 mL
Betaine 5M; 1 mL	40-3032-10	1 mL

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