Specification

Formamide deionized for molecular biology A2156

Refractive Index:	n20/D 1.4472
Physical Description:	Liquid
Product Code:	A2156
Product Name:	Formamide deionized for molecular biology
Headline Comment:	• For scientific research and laboratory use only!
Specifications:	DNases/RNases/Proteases: not detectable Assay (from N): min. 99.5 % Water: max. 0.1 % Chloride: max. 0.00005 % Fe: max. 0.00001 % Pb: max. 0.00001 %
Hazard pictograms	
WGK:	1
Storage:	RT
Signal Word:	Danger
GHS Symbols:	GHS08
H Phrases:	H351 H360D H373
P Phrases:	P201 P281 P308+P313

AppliChem GmbH
Ottoweg 4 • D-64291 Darmstadt • Phone +49 6151 9357 0 • Fax +49 6151 9357 11 • **info.de@itwreagents.com** • **www.itwreagents.com**
CEO Joan Roget • Commerzbank Darmstadt • Bank 508 800 50 • Account 0186989900 IBAN DE24 5088 0050 0186 9899 00 • Swiftcode DRESDEFF508 • Finanzamt Darmstadt 07 228 16476 • Register court Darmstadt HRB Nr. 7340

Specification

Formamide deionized for molecular biology A2156

Molecular Formula:	$HCONH_2$
M:	45.04 g/mol
CAS:	75-12-7
EINECS:	200-842-0
CS:	29241900
Index Nr.:	616-052-00-8

Comment

RNA and DNA with a chain length of >150 - 200 base pairs completely denature at room temperature in 98 % formamide, but not in 7 M urea. This allows the exact determination of the size of DNA or RNA single strands, because under these conditions the base composition and secondary structure have no influence on the migration behavior. The polyacrylamide gel contains 98 % deionized, anhydrous formamide. Acrylamide and bisacrylamide are dissolved in the formamide (1-4). The loading buffer contains formamide, too (see AppliChem's loading buffers!). A similar technique of formamide-containing sequencing gels can be used for the sequencing of nucleic acids, when the secondary structure of the sequencing product causes an anormalous migration, i.e. compression of bands. Inclusion of up to 40 % of formamide is possible to overcome this problem (Ref. 8, pages 7.6.9-7.6.10 Supplement 16).The stability of RNA is in formamide higher than in DEPC-treated water. RNA may be stored for more than a year in formamide at -20°C, instead of storage at -70°C in DEPC-treated water.Besides gel electrophoresis deionized formamide is used for the hybridization of nucleic acids. Formamide reduces the melting temperature of a DNA-DNA hybrid by an average of 0.6°C per 1 % formamide; the maximum concentration is 50 %. By adding formamide, the temperature during the hybridization process can be reduced in comparison to an aqueous solution. At lower temperatures less DNA will detach from the nitrocellulose membrane. In addition, the background hybridization of heterologues RNA probes will be reduced. In combination with nylon membranes, no major advantage was observed.A typical formamide-containing prehybridization/hybridization solution may be composed of: 5X SSC, 5X Denhardt solution, 50 % (w/v) formamide, 1 % (w/v) SDS and 100 µg/ml denatured salmon sperm DNA added just before use (ref. 8, p. 2.10.7 Supplement 35). The use of formamide-containing buffers increase the specific hybridisation in blotting experiments and reduces thereby the number of washing steps. This should be taken into account, if one switches to buffers without formamide (6).

Bibliography

(1)Pinder, J.C. *et al.* (1974) *Biochemistry* **13**, 5367-5373Properties of RNA in Formamide. (2)Pinder, J.C. *et al.* (1974) *Biochemistry* **13**, 5373-5378Electrophoresis of RNA in Formamide. (3)Maniatis, T. & Efstratiadis, A (1980) *Methods Enzymol.* **65**, 299-305Fractionation of low molecular weight DNA or RNA on polyacrylamide gels containing 98 % Formamide or 7 *M* Urea. (4)Meinkoth, J. & Wahl. G. (1984) *Anal. Biochem.* **138**, 267-284Hybridisation of nucleic acids, immobilized to membranes. (5)Chomczynski, P. (1992) *Nucleic Acids Res.* **20**, 3791-3792Storage of RNA in formamide increases stability of the RNA. (6)Cornish, E.C. *et al.* (1998) *BioTechniques* **25**, 948-954Improvement of the Southern blot method\: Influence of the hybridisation buffer. (7)Kafatos, F.C. *et al.* (1979) *Nucleic Acids Res.* **7**, 1541-1552Determination of nucleic acid sequence homologies with 'dot hybridization'. (8)Ausubel, F.A., Brent, R., Kingston, R.E., Moore, D.D., Seidman, J.G., Smith, J.A. & Struhl, K. (eds.) 2001. *Currrent Protocols in Molecular Biology*. John Wiley & Sons, N.Y.

AppliChem GmbH
Ottoweg 4 • D-64291 Darmstadt • Phone +49 6151 9357 0 • Fax +49 6151 9357 11 • **info.de@itwreagents.com** • **www.itwreagents.com**
CEO Joan Roget • Commerzbank Darmstadt • Bank 508 800 50 • Account 0186989900 IBAN DE24 5088 0050 0186 9899 00 • Swiftcode DRESDEFF508 • Finanzamt Darmstadt 07 228 16476 • Register court Darmstadt HRB Nr. 7340