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ProductInformation

ACRYLAMIDE
MOLECULAR BIOLOGY REAGENT
Sigma Prod. No. A 9099

STRUCTURE: $CH_2=CH-CO-NH_2$
CAS NUMBER: 79-06-1
SYNONYM: 2-propenamide

Product Description
Appearance: White powder
Molecular formula: C_3H_5NO
Molecular weight: 71.08
Melting point: 84.5 °C, although stable in the dark, it readily polymerizes at its melting point, in solution or under ultraviolet light.[1]
Special tests: DNase, RNase and Protease were not detected per procedures on lot-specific data sheet.

Acrylamide as a monomer is used in a variety of synthetic processes to form polymers, copolymers. It is readily polymerized in the presence of free radicals, usually in aqueous solutions. Polyacrylamide plastics have numerous commercial applications, due in part to the tendency of polyacrylamide to adsorb many times its own mass in water.

In biochemistry, its principle use is in the preparation of polyacrylamide gels, using suitable cross-linkage agents, for use in electrophoresis separation techniques. Common reaction initiators are riboflavin, ammonium persulfate; varying the ratio of acrylamide to crosslinking agent permits the formation of a gel with predictable average pore size and texture. A number of excellent laboratory manuals give specific protocols for preparing "PAGE" (Polyacrylamide Gel Electrophoresis) gels; see page 2 for a partial reference list. Acrylamide has a tendency to hydrolyze under acidic or basic conditions to form acrylic acid.

Acrylic acid and any ionic impurities in the acrylamide can have significant effects on the performance of the PAGE gel formed, since the voltage across the gel is affected by the ionic charge of the gel and usage buffers. Sigma tests each lot of A9099 for its suitability for use in electrophoresis of nucleic acids (more detail is available on lot-specific information sheets sent with the product.) Several other products are also available: A 3553, Electrophoresis Reagent, which has a higher purity specification and additional testing for trace impurities, solution conductivity and acrylic acid content; and A 4058, which is a ready-to-use 40% solution prepared from A 3553; A8887 is also of high purity, but has not received as extensive testing for application suitability.

NOTE:
Acrylamide as a monomer is considered toxic, directly affecting the nervous system, and it may reasonably be considered to be a carcinogen.[4] Acrylamide is readily absorbed through intact skin from aqueous solutions.[1] Please consult the Material Safety Data Sheet and appropriate safety procedures before handling this material. Once polymerized, the solid POLYacrylamide is considered quite safe, although PAGE gels should still be handled with gloves under the assumption that they may still contain unreacted monomer.

Storage/Stability
If acrylamide is kept protected from light, it is expected to be stable indefinitely at room temperature. After three weeks storage at 50 °C, there is no evidence of polymer formation and only slight yellowing occurs. Even after 24 hours at 80 °C (slightly below melting), pure samples show little or no polymer formation.[3] It should be evaluated for continued suitability every three years.

Acrylamide is routinely tested at 250 mg/mL in water, giving a clear colorless solution. It is soluble at least to 40% (w/v) in water[2], and reportedly up to 215 g/100 mL in water at 30 °C.[1] It is soluble in methanol (155 g/100 mL), ethanol (86 g/100 mL), acetone (63.1 g/100 mL); only minimally soluble in benzene or heptane.[1]

Solutions should be stable at 2-8 °C for at least a year if stored protected from light.[2]

References

1. *Merck Index*, 12th Ed., #131 (1996).
2. Sigma data.
3. Supplier information.
4. Sigma Material Safety Data Sheet.

Additional Usage References:

1. *Protein Structure: A Practical Approach*, ed. T.E. Creighton (IRL PRESS, 1990), pages: 4-8, 36-38, 523-55, 79-80, 150-151, 233-234.
2. *Gel Electrophoresis: Essential Data*, D. Patel (Wiley Press, 1994) - A small book with extensive recipes for gel production.
3. *Gel Electrophoresis of Proteins: A Practical Approach*, 2nd Ed., eds. B.D. Hames and D. Rickwood (IRL Press, 1994)
4. *Electrophoresis: Theory, Techniques, and Biochemical and Clinical Applications*, 2nd Ed., A.T. Andrews (Oxford University Press, 1986).

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