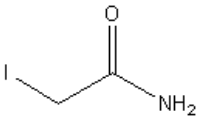
Catalog Number: 100351

Iodoacetamide

Structure:



Molecular Formula: C_2H_4INO

Molecular Weight: 185

CAS # 144-48-9

Synonyms: IAN; alpha-Iodoacetamide; Monoiodoacetamide; 2-Iodoacetamide; Surauto

Physical Description: White to light yellow crystalline powder. May discolor to yellowish on storage.

Solubility: Soluble in water (recommended stock solution is 10-100 mM). All solutions should be prepared fresh for each use since solutions are very light sensitive.

Description: A thiol reagent; alkylating reagent for cysteine and histidine residues in proteins. In the alkylation reaction, it reacts with histidine (such as in RNase[3]), methionine and sulfhydryl groups of many proteins. Iodoacetamide can react with low molecular weight thiol compounds such as mercaptoethanol and glutathione.[2] The reaction with glutathione is utilized in a titration method for the determination of sulfhydryl groups in different compounds.[1] The alkylation reaction forms stable protein derivatives which will remain intact during further study of the protein.[4,7,8,9]

Useful in peptide sequencing and as an irreversible enzyme inhibitor. Some enzymes iodoacetamide will inhibit include (but is not limited to):

- Alcohol dehydrogenase
- Alkaline phosphatase (calf intestinal)
- beta-Amylase
- Cathepsin B
- Galactose oxidase
- Heme oxygenase
- L-Lysine decarboxylase

It will irreversibly inhibit the dephosphorylation of both epidermal growth factor receptor and platelet-derived growth factor receptor by alkylation at the active center of one or several protein tyrosine phosphatases in cell lines.[6] Iodoacetamide will also irreversibly inhibit many cysteine proteases. The effective concentration for use as a protease inhibitor is 10-100 uM.

References:

1. Benesch, R. and Benesch, R.E., *Biochim. Biophys. Acta*, **v. 23**, 643 (1957).
2. Beynon, R.J. and Bond, J.S. (eds.), *Proteolytic Enzymes: A Practical Approach*, IRL Press, Oxford, England, 245 (1989).
3. Fruchter, R.G. and Crestfield, A.M., *J. Biol. Chem.*, **v. 242**, 5807 (1967).
4. Gurd, F.R.N., *Methods Enzymol.*, v. 25, 424 (1972).
5. Herbert, B., "Reduction and alkylation of proteins in preparation of two dimensional map analysis: Why, When and How." *Electrophoresis* (2001).
6. Knebel, A., et al., *EMBO J.*, v. 15, 5314 (1996).
7. Lundblad, R.L., *Techniques in Protein Modification*, CRC Press, London, p. 107 (1995).
8. Nishita, T. and Deutsch, H.F., *Biochem. Biophys. Res. Commun.*, **v. 103**, 573 (1981).
9. Takahashi, K., et al., *J. Biol. Chem.*, **v. 242**, 4682 (1967).