>>**Entry Name: Acetylene**
Synonym(s): Ethyne, 9CI

CAS Registry Number: 74-86-2
Related CAS Registry Numbers(s): 1066-26-8 1070-74-2 2122-48-7 2210-34-6 12595-78-7 16456-59-0 16753-36-9 29075-95-4
Extra CAS Registry Numbers(s): 25641-79-6
HC≡CH

Molecular Formula: C_2H_2
Molecular Weight: 26.038
Accurate Mass: 26.01565
Percentage Composition: C 92.26%; H 7.74%
Source/Synthesis: Obt. commercially from the cracking of crude oil. For many years a chemical feedstock for the industrial production of Chloroethylene CXM64-C (for PVC), vinyl acetate (for PVA emulsion paints and adhesives), Acetaldehyde DFR74-T (for conversion into acetic acid) and 2-Propenoic acid DFS27-M (for acrylic fibres and adiponitrile used in nylon production). Most of these compounds are now made competitively starting from Ethylene BGV03-C
Use/Importance: Undergoes Ziegler-Natta polym. to give elec.-conducting polyacetylene. Welding gas
Physical Description: Gas with an unpleasant odour
Melting Point: Mp –80.7°
Boiling Point: Bp –84°
Solubility: Sl. sol. H_2O; mod. sol. EtOH, AcOH, C_6H_6; v. sol. Me_2CO
Density: d^0 0.045175
Other Data: H_2O diss. 1 vol at 18°. Me_2CO diss. 25 vols at 15°/760mm., 300 vols at 12 atm., 2000 vols at –80°. Crit. point 37°/61.5 atm.
Hazard & Toxicity: Extremely flammable, may explode on heating, fl. p. –18°, autoignition temp. 305°. Forms many highly explosive metallic derivs. Inhalation may cause dizziness, headache and nausea. High. conc. anaesthetic

Aldrich: 32111-7

>>**Derivative:** Na deriv.

Use/Importance: Reagent for synth. of polyalkenes
Solubility: Insol. Et_2O, C_6H_6
Other Data: Dec. at 210-20°
Hazard & Toxicity: Dec. at 150° evolving spont. inflammable gas, reacts violently with Cl_2 and Br_2

>>**Derivative:** Cu deriv.

Solubility: Insol. H_2O
Hazard & Toxicity: Explodes at 120°

References:

Miller, S.A., *Acetylene: Prop. Manuf. Uses*, E. Benn Ltd., London, 1965
Fieser and Fieser's Reagents for Organic Synthesis, Wiley, 1967, **1**, 11; 1977, **6**, 61; 1975, **5**, 173; 1982, **10**, 284; 1969, **2**, 1282, *(use)*
Chemistry of Acetylenes, Am. Chem. Soc. Monograph No. 99, 1969
Ger. Pat., 1971, 1 418 664; *CA*, **76**, 3385j, *(synth)*
Enkelmann, V. *et al.*, *Angew. Makromol. Chem.*, 1981, **94**, 105, *(rev, polymer)*
Encyclopaedia of Polymer Science and Engineering, Wiley-Interscience, New York, 2nd edn., 1985, **1**, 87, *(rev, polym)*
Kirk-Othmer Encycl. Chem. Technol., 4th edn., Wiley, 1991, **13**, 760, *(rev)*
Patty's Ind. Hyg. Toxicol. (3rd Rev. edn.), Vol. 2, Wiley, 1980, 3211
Bretherick, L., *Handbook of Reactive Chemical Hazards, 4th edn., Butterworths*, 1990, 0651
Luxon, S.G., *Hazards in the Chemical Laboratory, 5th edn., Royal Society of Chemistry*, 1992, 12
Lewis, R.J., *Sax's Dangerous Properties of Industrial Materials, 8th edn., Van Nostrand Reinhold*, 1992, ACI750