

Acrylic acid is an unsaturated carboxylic acid. It reacts as a vinyl compound and as a carboxylic acid. It readily undergoes polymerization and addition reactions. It can be used as a carboxylic acid to produce acyclic esters, acrylamide, N-substituted acrylamides and acrylyl chloride by common methods.

Copolymers can be produced with acrylic and methacrylic esters, acrylonitrile, maleic acid esters, vinyl acetate, vinyl chloride, vinylidene chloride, styrene, butadiene and ethylene.

Homopolymers of acrylic acid and copolymers which contain a preponderance of acrylic acid have a glassy consistency and are frequently soluble in water. They can be used in the form of their free acids and ammonium and alkali salts in many different applications, such as thickeners, dispersing agents, flocculants, protective colloids for stabilizing emulsions and polymer dispersions, wetting agents, coatings and textile finishes.

Acrylic acid readily undergoes addition reactions with a wide variety of organic and inorganic compounds. This makes it a very useful feedstock for the production of many low molecular compounds. For instance, acrylic acid can be used to produce derivatives of propionic acid with water, alcohols, amines, halogens and chlorinated hydrocarbons. It can also be

used with other substances to produce unsaturated fatty acids, heterocyclic compounds and Diels-Alder addition products.

Acrylic acid polymerizes very readily. It is generally stabilized with 200 ppm of hydroquinone monomethyl ether (MEHQ). It is only supplied in its stabilized form, because it can polymerize with explosive violence if it is not stabilized. It is not usually necessary to remove the stabilizer because its action can be compensated for by adding an excess of initiator.

Purity (% m/m):  $\geq 99.5$

Color (PT-CO):  $\leq 10$

Water (% m/m):  $\leq 0.10$

Inhibitor [MEHQ % m/m ] /10-6:  $200 \pm 20$  (Negotiable)

Total aldehyde (% m/m):  $\leq 0.001$

Appearance clear, colorless

Physical form liquid at  $>13^{\circ}\text{C}$

Odor        pungent

Density at 25°C g/cm<sup>3</sup> 1.046

Refractive index  $n_D$  at 20°C 1.418-1.422

Boiling point °C 141

Freezing point °C ca. 13

Viscosity @ 20°C mPa•s 1.3

Specific heat of liquid at 20°C kJ/kg°C 2.05

Heat of evaporation at boiling point kJ/kg 634

Heat of polymerization kJ/kg 1079

Heat of combustion at 25°C kJ/kg 19085

Vapor pressure at 20°C mbar 3.8