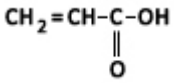
TECHNICAL DATA SHEET

ACRYLIC ACID - STABILIZED - PURE

Non-saturated organic acid used for polymer manufacturing and as a raw material for syntheses.

Molar Mass(g/mol): 72.06

Chemical formula:



Stoichiometric formula: $C_3H_4O_2$
CAS number: 79-10-7

For further information regarding this product please refer to:

Monomers Sales Synthomer

eMail: monomers@synthomer.com

Property	Typical Value	Unit	Method[1]
Appearance	Clear, colorless liquid	-	Visually
Acrylic acid (including dimer)*	min. 99.7	%	
Acrylic acid (without dimer)	min. 99.5	%	
Acrolein	max. 0.0005	%	
Furfuraldehyde	max. 0.0007	%	
Benzaldehyde	max. 0.0003	%	
Aldehydes***	max. 0.001	%	
Acetic acid	max. 0.15	%	
Propionic acid	max. 0.05	%	
Other organic acids**	max. 0.16	%	
Toluene	max. 0.0002	%	
Acrylic acid dimer * on dispatch date	max. 0.5	%	
Color	max. 10	APHA	ASTM D 1209
Water****	max. 0.1	%	ASTM E 1064
Inhibitor (MEHQ) *****	0.018 – 0.022	%	ASTM D 3125

[1] internal method based upon the specified norm

* The content of dimer in acrylic acid does not depend on the amount of added inhibitor but it is a function of the storage temperature and time.
The content of dimer rises continually depending on the storage temperature. The increase ranges from 0.1 wt% at 15°C to 0.4 wt% at 25°C per month.

** Other organic acids include acetic acid and propionic acid

*** Aldehydes include acrolein, furfuraldehyde and benzaldehyde

**** Water content rises depending on the length of storage by about 0.05 wt% per month

***** The inhibitor content can be increase above the standard limit as per customer's request

Application Advice

There are two reaction centers in acrylic acid molecule for possible reactions – the double bond and the carboxylic group. It readily undergoes polymerization and addition reactions on the unsaturated group. And it reacts on the carboxylic group forming esters, amides etc.

Co-polymers can be produced with acrylic esters, methacrylates, styrene, acrylonitrile, vinyl acetate, vinyl chloride, butadiene, ethylene etc. Homopolymers and polar co-polymers are frequently soluble in water. They can be used in the form of acid or salts in many applications, such as thickeners, dispersing agents, flocculants, wetting agents, super-absorbents etc. Water or solvent dispersion of polymers are used in coatings, adhesives, textile or paper industry etc. Acrylic acid is a very important raw material for manufacturing of many propionic acid derivatives or specialty monomers used in a great variety of chemical processes and technologies.

Parameter	Value, Unit
Appearance, form	Transparent, colorless, clear liquid above 13 °C
Odor	Characteristic, pungent, acrid
Boiling point	141 °C
Melting point	13 °C
Vapour pressure at 20 °C	0.38 kPa
Vapour pressure at 40 °C	1.35 kPa
Vapour pressure at 60 °C	4.0 kPa
Vapour pressure at 100 °C	23.8 kPa
Vapour pressure at 120 °C	50.0 kPa
Flash point (Albert-Pensky)	48 °C
Explosion limit – upper at 47.5 °C	15.9 % v/v (at 101.3 kPa)
Explosion limit – lower at 88.5 °C	2.4 % v/v (at 101.3 kPa)
Autoignition temperature	438 °C
Heat of evaporation at boiling point	634 kJ / kg
Heat of polymerization	1075 kJ / kg
Heat of combustion	19080 kJ / kg
Heat of neutralization	805 kJ / kg
Specific heat of liquid at 20 °C	2.05 kJ / kg.K
Density of liquid at 20 °C	1050 kg / m3
Vapour density (air=1)	> 2.5
Dissociation constant at 25 °C	5.74 × 10-5
Refractive index at 20 °C	1.418 – 1.422
Viscosity at 20 °C	1.15 mPa.s
Solubility acid in water	soluble in all proportions
Solubility in organic solvents	soluble in all proportions (in most solvents)
Electrical conductivity	4.4 × 104 pS / m

Shipping and Storage

Acrylic acid is transported in specially equipped railway cars or tanker trucks.
Transport containers are filled to a maximum of 94 % of their capacity.

In order to prevent spontaneous polymerization, acrylic acid must always be stored under air, never under inert gases.The air (oxygen) presence is required for proper functionality of the stabilizer. Product storage temperature must be between 15 and 25 °C.

Under these conditions, a storage stability of one year can be expected. It is advisable to minimize the likelihood of acrylic acid overstorage by a strict observance of the“first-in-first-out” storage principle. For storage periods extended over 4 weeks, it is advisable to replenish the dissolved oxygen content in the product by suitable aeration.
Dimer of acrylic acid is formed during storage and this process is inevitable and cannot be prevented. The dimer formation is promoted

solely by higher storage temperature and storage period.
The contained dimer of acrylic acid could affect acrylic acid reactivity and performance in some processes.
It is necessary to prevent freezing of acrylic acid, therefore the acrylic acid temperature should never drop under 15 °C. Unsuitable thawing of solidified acrylic could lead to a spontaneous and dangerous polymerization accompanied by a massive heat release or even an explosion. Do not thaw frozen acrylic acid without consultation and approval from your supplier.
Under no circumstances should steam be used to heat or thaw acrylic acid.

Stainless steel is the recommended material for storage tanks and piping. Avoid contamination with alloys containing copper or silver. All metal made equipment (tanks, pumps, piping etc.) must be earthed. All national laws and directives, as well as local regulations governing storage, handling, distribution and disposal of flammable liquids must be strictly observed. Avoid exposure to high temperatures, sparks, flame, light and frost. Keep separated from oxidizing materials. Keep the container tightly closed. For additional detailed information see the brochure „SAFE HANDLING AND STORAGE OF ACRYLIC ACID“, issued by the European Basic Acrylic Monomers Manufacturers Association (EBAM).

Product Safety

Please refer to the Safety Data Sheet for safety information.