

Glycolic Acid

Product Attributes

Technical Information

Chemical and Physical Stability

Glycolic acid 70% technical solution and Glypure™ 70% solution are chemically stable when stored at normal temperatures. These products are physically stable if they are stored at temperatures above 10 °C (50 °F). At colder temperatures, glycolic acid crystals can form. The crystals can be put back into solution by warming the container with stirring. This does not affect chemical quality. Personnel from Chemours can provide detailed procedures for reconstituting precipitated glycolic acid.

The Glypure™ 99% crystalline grade of glycolic acid is chemically stable to 50 °C (122 °F). Above this temperature, polymerization begins to occur. Chemours guarantees the specification chemical quality of its glycolic acid products for two years, provided the container has not been opened. Chemours can help customers determine if the quality of their glycolic acid is still viable.

Properties of Equilibrium

Glycolic Acid 70% Technical Solution		
Concentration of Glycolic Acid Solution, %	% Free Acid at 25 °C (77 °F)	Precipitation Point, °C (°F)
0.0	0.0	0 (32)
10.0	10.0	-2 (28)
20.0	19.9	-5 (23)
30.0	29.6	-9 (16)
40.0	39.0	-14 (7)
50.0	47.7	-19 (-2)
60.0	56.2	-5 (23)
70.0	63.6	9.5 (49)
80.0	69.0	22 (72)
90.0	71.8	32 (90)
100.0	68.0	37 (99)

Physical Properties

Glycolic Acid 70% Technical Solution	
Weight	
lb/gal at 15.6 °C/60 °F	10.6
kg/L at 15.6 °C/60 °F	1.27
Density, g/mL at 15.6 °C (60 °F)	1.27
Coefficient of Thermal Expansion	
at 15.6–60 °C	0.00047
at 60–140 °F	0.00026
Viscosity, MPa/s	
at 15.6 °C (60 °F)	11.28
at 43.3 °C (110 °F)	3.49
Heat Capacity, Btu/lb-ft at 25 °C (77 °F)	0.579
Heat of Solution, kJ/mol	-11.55
Enthalpy, Btu/lb-ft at 25 °C (77 °F)	-464.4
Heat of Combustion, kcal/mol	166.6
Boiling Point, °C (°F)	112 (234)
Precipitation Point, °C (°F)	10 (50)
pH at 25 °C (77 °F)	0.1
Dissociation Constant at 25 °C (77 °F)	1.5×10^{-4}
Heat of Neutralization, kcal/mol	-52.02
Biological Oxygen Demand (BOD) at 5 days (standard diluted sewage)	0.175
7-day Biodegradability, %	89.6
Volatile Organic Compound (VOC), at 101 °C (213 °F), 45 min	99.6 (water)

Materials of Construction and Corrosion Information

General Corrosion Information

Stainless steels are resistant to corrosion over a wide range of temperatures and glycolic acid concentrations. Monel and Inconel are suitable materials of construction. Glycolic acid is mildly corrosive to iron, mild steel, tin, and aluminum at ambient temperatures. Copper and bronze are resistant in the absence of air.

A wide variety of polymeric materials, like polypropylene, PVC, epoxy, vinyl ester, and polyethylene, are stable to glycolic acid, depending on acid concentration and temperature.

Specific corrosion data is available upon request.

Storage Equipment

Tanks constructed of 304 stainless steel are recommended for storage at temperatures up to 50 °C (122 °F). 316 stainless steel is recommended for temperatures up to 70 °C (158 °F). Mild steel lined with Heresite or Plasite can be used at ambient temperatures. Limited experience shows that fiber-reinforced plastic tanks are suitable for concentrations below 30% or for use in a heated storage building.

Process Equipment

Piping of 304 or 316 stainless steel is suggested. Chlorinated polyvinyl chloride (CPVC) can be used at temperatures up to 50 °C (122 °F). Elevated temperatures (above 70 °C [158 °F]), particularly in the presence of mineral acids and water, require materials of construction like silver lining.

Plug or ball valves made of 316 stainless steel, with Teflon™ gaskets, are recommended.

Fiber-filled gaskets are preferred, because they are less susceptible to failure. Kalrez®, Viton™, and Nordel™ are accepted materials of construction for O-rings. Kalrez® O-rings offer the highest level of performance.

Suitable materials of construction for pumps depend on the process conditions. In mild service, stainless steel is acceptable. In harsh service, Hastelloy®, Alloy 20 ALX6XN, or titanium should be evaluated.

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