

2.6 SULFURIC ACID (H₂SO₄)

2-6-1 CHARACTERISTICS

Sulfuric acid is used both as an ingredient in the paste and as an electrolyte. In each application, dilute sulfuric acid is obtained by mixing concentrated sulfuric acid of 1.835 specific gravity with water to the strength required.

Sulfuric acid concentrations most frequently used in battery manufacturing correspond to a specific gravity range of 1.050 to 1.400.

Sulfuric acid should be of high purity. The presence of even very small amount of certain impurities can affect both the life and capacity of the battery adversely.

NO	ITEM		SPECIFICATION
1	Color		Colorless and Pellucid Liquids
2	Specific Gravity (25°C)		Normal type : 1,310 ± 0.005 Motor cycle type : 1,280 ± 0.005
3	Purity	SO ₄	Normal type : 42.4 ± 0.6% Motor cycle type : 38.5 ± 0.6%
		Iron	Less than 0.0002%
		Chloride	Less than 0.0008%
		Arsenic	Less than 0.00002%
		Fixed Residue	Less than 0.002%

2-6-2 FREEZING POINT OF SULFURIC ACID

The freezing point of the sulfuric acid electrolyte varies with the concentration. As can be seen from table below, the freezing point of the electrolyte in a discharged battery is high enough to be a significance during normal winter weather, while that of a fully charged battery at 1.250 specific gravity is low enough to be safe under all weather conditions. These points are of importance in the storage and operation of battery under severe cold weather conditions.

< Freezing Point of Sulfuric acid solutions >

Specific Gravity (15.5°C)	Freezing point		Specific Gravity (15.5°C)	Freezing point	
	°C	°F		°C	°F
1.000	0	+32	1.400	-37.0	-34
1.025	-1.7	+29	1.425	-32.5	-26
1.050	-3.9	+25	1.450	-29.1	-20
1.075	-5.6	+22	1.475	-27.4	-17
1.100	-8.4	+17	1.500	-28.0	-18
1.125	-11.2	+12	1.525	-31.4	-24
1.150	-15.1	+5	1.550	-39.2	-38
1.175	-20.2	-4	1.575	-47.6	-53
1.200	-28.0	-18	1.600	-51.0	-59
1.225	-39.8	-39	1.625	-50.4	-58
1.250	-54.3	-65	1.650	-45.9	-50
1.275	-70.0	-93	1.675	-34.7	-30
1.300	-71.1	-95	1.700	-15.7	+4
1.325	-65.5	-85	1.725	-5.0	+23
1.350	-51.5	-60	1.750	+3.4	+38
1.375	-43.1	-45	1.775	+6.7	+44

