



>>Entry Name: Sodium sulfate, decahydrate

ENTRY UNDER REVIEW

Synonym(s): Glauber's salt

CAS Registry Number: 7727-73-3

$\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$

Molecular Formula: $\text{H}_{20}\text{Na}_2\text{O}_{14}\text{S}$

Molecular Weight: 322.195

Accurate Mass: 322.036914

Percentage Composition: H 6.26%; Na 14.27%; O 69.52%; S 9.95%

Source/Synthesis: Cryst. from aq. Na_2SO_4

Use/Importance: Commercially available. Used in heat storage systems and, less extensively, in fire-resistant insulation materials

Physical Description: Colourless monoclinic cryst., efflorescent. Dec. on heating with H_2O loss ($-10\text{H}_2\text{O}$ at 100°) to form Na_2SO_4

Solubility: V. sol. H_2O (11 g per 100 cm^3 at 0° ; 93 g per 100 cm^3 at 30°); insol. EtOH

Other Data: $\Delta H_f^\circ -4324\text{ kJ mol}^{-1}$; $\Delta G_f^\circ -3644\text{ kJ mol}^{-1}$; $S^\circ 593\text{ JK}^{-1}\text{ mol}^{-1}$

Hazard & Toxicity: Irritant

Aldrich: 24698-0

Fluka: 71969

Sigma: S0778

>>Variant: Mineral-form

Synonym(s): Mirabilite

CAS Registry Number: 14567-58-9

Molecular Formula: $\text{H}_{20}\text{Na}_2\text{O}_{14}\text{S}$

Molecular Weight: 322.195

Accurate Mass: 322.036914

Percentage Composition: H 6.26%; Na 14.27%; O 69.52%; S 9.95%

Source/Synthesis: Occur. widespread in saline lake deposits

Physical Description: White cryst.

References:

Theimer, O. *et al.*, *Monatsh. Chem.*, 1950, **81**, 301; 424, (*Raman*)

Ruben, H.W. *et al.*, *J.A.C.S.*, 1961, **83**, 820, (*cryst struct*)

Gmelin Handbook Inorg. Chem., Syst. No. 21, 1966, **3**, 1113, (*rev, bibl*)

Clough, R.W., *Handb. Ind. Chem.*, 7th. Ed., 1974, 123, (*rev, uses*)

Kirk-Othmer Encycl. Chem. Technol., 3rd edn., Wiley, 1978, **21**, 205, (*rev, uses*)

Kimura, H. *et al.*, *Ind. Eng. Chem. Fundam.*, 1985, **24**, 192; *CA*, **102**, 175305, (*ir*)

Tabeta, R. *et al.*, *Bull. Chem. Soc. Jpn.*, 1986, **59**, 1957, (*Na-23 nmr*)

Sigma-Aldrich Library of Chemical Safety Data, 1988, **2**, 3154C, (*haz*)

Encyclopedia of Food and Color Additives, (ed. Burdock, G.A.), CRC Press, 1997, 2611-2612