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Product Information

SODIUM CHLORIDE

Sigma Prod. No. S9625, S9888, and S7653

CAS NUMBER: 7647-14-5

SYNONYMS: halite; common salt or table salt; rock salt

PHYSICAL DESCRIPTION:

Appearance: white powder (crystalline)

Molecular formula: NaCl

Molecular weight: 58.44

Density of large crystals: 2.17 g/mL¹

Melting point: 804EC¹

STABILITY / STORAGE AS SUPPLIED:

Sodium chloride is geologically stable. If kept dry, it will remain a free-flowing solid for years. Traces of magnesium or calcium chloride in commercial sodium chloride adsorb moisture, making it cake. The trace moisture does not harm the material chemically in any way.

SOLUBILITY / SOLUTIONS STABILITY:

All three products dissolve in water to give a clear colorless solution, although tested at different concentrations: S9625 at 100 mg/mL, S9888 at 50 mg/mL and S7653 at 1 M (. 58 mg/mL).²

Maximum solubility of NaCl in water at 25EC is 357 mg/mL. NaCl is unusual in that its solubility does not increase appreciably with temperature, since at 100EC, the solubility is 384 mg/mL.¹ The solubility of NaCl in water is decreased by adding HCl; it is almost insoluble in concentrated HCl. The density of a saturated solution at 25EC is 1.202 g/mL. A saturated solution (23% w/v) freezes at -20.5EC (5EF).¹

Solutions of sodium chloride are stable at room temperature and may be autoclaved.

GENERAL REMARKS:

Sodium chloride is a commonly used chemical found in nature and in all body tissue, and is considered an essential nutrient. Although generally not considered poisonous, excess NaCl can destroy electrolyte balance and cause death.

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GENERAL REMARKS: (continued)

Sodium chloride is used in a wide variety of biochemical applications, including intravenous fluids (0.85% in water), density gradients, a diluent to increase ionic strength in buffers or culture media. Traditionally, it has been used in high concentrations for preservation of foods, etc., since bacteria cannot grow in high-salt conditions. A salt-and-ice mixture in the ratio 33 g NaCl to 100 g ice (at -1EC) will drop in temperature to as low as -21EC, depending on the rate of stirring and the size of the ice chunks.⁴

S9625 is reagent grade NaCl. S9888, ACS Reagent, meets criteria set by the American Chemical Society. S7653, SigmaUltra, has been tested for trace metals.

METHOD OF PREPARATION:

Much of the sodium chloride is mined from salts deposited from evaporation of brine of ancient oceans, or recovered from sea water by solar evaporation.

Due to the presence of trace hygroscopic minerals, food-grade salt has a small amount of silicate added to prevent caking; as a result, concentrated solutions of "table salt" are usually slightly cloudy in appearance. S9625, S9888 and S7653 do not contain any anti-caking agent.³

REFERENCES:

1. *Merck Index*, 12th Ed., #8742 (1996).
2. Sigma quality control.
3. Supplier information.
4. *The Chemist's Companion: A Handbook of Practical Data, Techniques and References*, eds. Gordon, A.J. and Ford, F.A. (John Wiley & Sons, 1972), p. 452.

Additional information on properties of sodium chloride may be found in the *CRC Handbook of Chemistry and Physics*, published annually.