



RXSOL

CHEMO PHARMA INTERNATIONAL

Technical Data Sheet (TDS)

RXSOL-60-6604-086

BORIC ACID POWDER

CAS NUMBER: 10043-35-3

SYNONYMS: boracic acid; orthoboric acid¹

PHYSICAL DESCRIPTION:

Appearance: white powder (B0394 and B7660 may have possible yellow cast)

Molecular formula: H_3BO_3

Molecular weight: 61.83

Melting point: $\sim 171^\circ\text{C}$ ¹

Boric acid volatilizes in steam. When heated to 100°C , the solid loses water and is slowly converted into metaboric acid

(HBO_2); tetraboric acid ($\text{H}_2\text{B}_4\text{O}_7$) is formed at 140°C and boron trioxide (B_2O_3) at higher temperatures.³

$\text{pK}_a = 9.23$ at 25°C ; $\text{DpK/DT} = -0.008$ ⁴

Useful buffering range is pH 8.2-10.1

Sigma offers several different boric acid products, slightly different in quality control descriptions:²

STABILITY / STORAGE AS SUPPLIED:

Boric acid is a very stable dry solid at room temperature. It should be stable indefinitely, but should be evaluated for continued suitability in user application every three to five years.

SOLUBILITY / SOLUTION STABILITY:

Boric acid dissolves in water: 1 gram in 18 mL cold water, in 4 mL boiling water, 6 mL boiling alcohol. Sigma tests B0252 at 40 g/mL, and B7660 at 1 M (62 g/mL), obtaining clear solutions. Powdered boric acid may dissolve more slowly in water than a crystalline product, but with gentle warming will dissolve to give a clear solution.

A 1 M solution of B7660 will have a pH of 3.5-6.0 in water at 20°C . Solutions of boric acid are stable at room temperature. They can be sterile-filtered or autoclaved.

GENERAL REMARKS:

Boric acid has in years past been used as a mild bacteriostatic and fungistatic agent, but has been mainly superseded by more effective disinfectants.⁴ It has been used as an insecticide, either alone or mixed with a sweetening agent, but its toxicity makes this use inappropriate around children or pet animals.^{1,3}

GENERAL REMARKS: (continued)

Borate buffers are commonly used in biochemistry, with some confusion as to what reagents should be used. Boric acid has a single boron; its salt forms complex equilibria in solution, with the ion $\text{B}_4\text{O}_7^{2-}$ being the predominant species. Many procedures do not give a method of preparation for the borate buffer intended; it is important to express the ionic strength in terms of boron molarity. One can titrate a 0.1 M solution of boric acid with sodium hydroxide to pH 9.0. If ionic strength is of no concern, titrating a solution of sodium tetraborate (borax) with HCl will also yield a buffer of pH 9.0, which contains NaCl. A 0.1 M solution of sodium tetraborate is 0.4 M in "boron ion." Several references give "recipes" for preparing borate buffers.⁴⁻⁶

B0252 is reagent grade; B7660, SigmaUltra, has been tested for trace metals; B0394, ACS Reagent, meets criteria set by the American Chemical Society; B7901 grade, Electrophoresis grade, has been tested in an electrophoresis system.

This Safety Data Sheet is provided by RXSOL. For the most current version of this document, please visit **eastindiachemicals.com**. This document is prepared in accordance with GHS / OSHA HazCom standards. The information contained herein is believed to be accurate but does not purport to be all-inclusive. It is the responsibility of the user to determine the suitability of this information for their application.