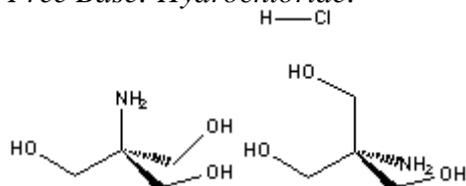


Catalog Number: 103130, 103132, 103133, 152176, 194557, 194558, 194855, 194856, 195605, 816100, 819620, 819623, 819638

## Tris and Tris hydrochloride

### Structures:

*Free Base: Hydrochloride:*



### Molecular Formula:

*Free Base:* C<sub>4</sub>H<sub>11</sub>NO<sub>3</sub> Molecular Weight: 121.1

*Hydrochloride:* C<sub>4</sub>H<sub>11</sub>NO<sub>3</sub>·HCl Molecular Weight: 157.6

### CAS #

*Free Base:* 77-86-1

*Hydrochloride:* 1185-53-1

**Synonyms:** Tris-[hydroxymethyl]aminomethane; THAM; 2-Amino-2-(hydroxymethyl)- 1,3-propanediol; Tromethamine; Trometamol

### pH of a 0.05 M aqueous Solution:

*Free Base:* 10.4

*Hydrochloride:* 4.7

### pKa (Tris Base): 8.1 at 25 ° C

**Description:** Tris and Tris Hydrochloride have been useful as buffers in a wide variety of biological systems. Uses include pH control *in vitro*<sup>1,2</sup> and *in vivo*<sup>3,4</sup> for body fluids and in buffering systems for electrophoresis applications.<sup>2,11</sup> Tris has been used as a starting material for polymers, oxazolones (with carboxylic acids) and oxazolidines (with aldehydes).<sup>6</sup> Tris does not precipitate calcium salts and is of value in maintaining solubility of manganese salts.<sup>7</sup> It can be used for the direct standardization of a strong acid solution; the equivalence point can be determined either potentiometrically or by use of a suitable indicator such as 3-(4-Dimethylamino-1-naphthylazo)-4-methoxybenzenesulfonic acid (MP # 157794).

Tris is relatively non-hygroscopic; however, if needed, Tris Base can be dried at 100 ° C for up to 4 hours to

remove any water.

Neither Tris Base or Tris Hydrochloride by themselves provide adequate buffering capacity. Generally the two need to be mixed together to provide a buffer with pH between 7 and 9 to provide adequate buffering. Typical mixtures would be:

pH at Temperature		g/L for 0.05 M Solution		
5 ° C	25 ° C	37 ° C	Tris HCl	Tris Base
7.76	7.20	6.91	7.02	0.67
7.89	7.30	7.02	6.85	0.80
7.97	7.40	7.12	6.61	0.97
8.07	7.50	7.22	6.35	1.18
8.18	7.60	7.30	6.06	1.39
8.26	7.70	7.40	5.72	1.66
8.37	7.80	7.52	5.32	1.97
4.48	7.90	7.62	4.88	2.30
8.58	8.00	7.71	4.44	2.65
8.68	8.10	7.80	4.02	2.97
8.78	8.20	7.91	3.54	3.34
8.88	8.30	8.01	3.07	3.70
8.98	8.40	8.10	2.64	4.03
9.09	8.50	8.22	2.21	4.36
9.18	8.60	8.31	1.83	4.65
9.28	8.70	8.42	1.50	4.90
9.36	8.80	8.51	1.23	5.13
9.47	8.90	8.62	0.96	5.32
9.56	9.00	8.70	0.76	5.47

Alternatively, Tris buffers can be made by using Tris Base and titrating with a hydrochloric acid solution to the desired pH value.

**Effects of Temperature on pH:** As Tris solutions decrease in temperature from 25 ° C to 5 ° C, the pH value increases an average of 0.03 units per ° C. As the solution increases in temperature from 25 ° C to 37 ° C, the pH decreases an average of 0.025 units per ° C.

**Effects of Concentration on pH:** Increasing the total Tris concentration from 0.05 M to 0.5 M will increase the pH by about 0.05. Decreasing the concentration from 0.05 M to 0.005 M will decrease the pH by about 0.05.

**Sterilization of Solutions:** Tris solutions can be autoclaved (121 ° C, 15 psi, 15 minutes) or sterile filtered.

**Solubility (Tris Base):** Soluble in water (550 mg/ml), ethylene glycol (79.1 mg/ml), methanol (26 mg/ml), anhydrous ethanol (14.6 mg/ml), 95% ethanol (22.0 mg/ml), DMF (14 mg/ml), acetone (2 mg/ml), ethyl acetate (0.5 mg/ml), olive oil (0.4 mg/ml), and chloroform (0.05 mg/ml)

**Availability:**

Catalog Number	Description	Si  コスモ・バイオ株式会社
819620	Tris, Ultra Pure	50
819623	Purity: Not less than 99.9%	1 kg

819638		5 kg
103133	Tris Purity: Not less than 99.95%	100 g 250 g 500 g 1 kg 5 kg 10 kg
194557	Tris, Cell Culture Reagent	100 g 500 g 1 kg 5 kg
194855	Tris, Molecular Biology Reagent	100 g 250 g 500 g 1 kg 5 kg
195605	Tris, U.S.P. Grade Purity: Not less than 99.95%	50 g 100 g 500 g 1 kg
152176	Tris Purity: Approximately 99.0% to 99.5%	100 g 250 g 500 g 1 kg 5 kg 10 kg
103132	Tris, Technical Grade Purity: Not less than 96%	500 g 1 kg 5 kg 25 kg
103130	Tris Hydrochloride Purity: Not less than 99%	100 g 250 g 500 g 1 kg 5 kg
816100	Tris Hydrochloride Purity: Not less than 99%	1 kg
194558	Tris Hydrochloride, Cell Culture Reagent	100 g 500 g 1 kg 5 kg
194856	Tris Hydrochloride, Molecular Biology Reagent	100 g 250 g 500 g

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