



>>Entry Name: Disodium phosphate, 9CI, 8CI

ENTRY UNDER REVIEW

Synonym(s): Disodium monohydrogenphosphate. Sodium phosphate (Na_2HPO_4). Seldium phosphate dibasic, USAN

CAS Registry Number: 7558-79-4

Related CAS Registry Numbers(s): 7632-05-5 118830-14-1

Type of Compound Code(s): XA4930 WC1100 WC2400 WC4600 XA1950 XA4140 WC4900 WK6000

Na_2HPO_4

Molecular Formula: $\text{HNa}_2\text{O}_4\text{P}$

Molecular Weight: 141.959

Accurate Mass: 141.940781

Percentage Composition: H 0.71%; Na 32.39%; O 45.08%; P 21.82%

General Statement: ^{32}P labelled compd. is used as an antineoplastic and antipolycythermic agent and as a neoplasm diagnostic aid (*Phosphote*)

Source/Synthesis: Synth. from $\text{NaOH} + \text{H}_3\text{PO}_4$

Use/Importance: Employed in fire-proofing, corrosion inhibiting, and catalyst formulations. Constituent of some buffer solns. Used to stabilise oxidants, esp. H_2O_2 . Laxative. Used to treat hypophosphataemia. Pharmaceutical excipient (buffering and sequestering agent)

Physical Description: Hygroscopic powder

Solubility: Sol. H_2O (6.4 g per 100 cm^3 at 18°; 12.1 g per 100 cm^3 at 25°)

Other Data: Dehydrates to Sodium diphosphate ($\text{Na}_4(\text{P}_2\text{O}_7)$) HTW34-S at 290-380°. $\Delta H_f^\circ -1746 \text{ kJ mol}^{-1}$

Hazard & Toxicity: Eye and skin irritant

Aldrich: 25579-3

Fluka: 71639

Sigma: S0876

>>Derivative: Dihydrate

Synonym(s): Sorenson's sodium phosphate. Sorenson's salt

CAS Registry Number: 10028-24-7

Molecular Formula: $\text{H}_5\text{Na}_2\text{O}_6\text{P}$

Molecular Weight: 177.989

Accurate Mass: 177.961911

Percentage Composition: H 2.83%; Na 25.83%; O 53.93%; P 17.40%

Solubility: V. sol. H_2O (100 g per 100 cm^3 at 50°; 117 g per 100 cm^3 at 80°)

Other Data: Orthorhombic. Two independent distorted Na polyhedra (coordination numbers 5(or 6) and 6(or 7)) share corners, edges or faces. $\text{PO}_3(\text{OH})$ tetrahedra are H-bonded and lie between the Na chains. $\Delta H_f^\circ -2344 \text{ kJ mol}^{-1}$. Loss $2\text{H}_2\text{O}$ at 95°

Fluka: 71645

>>Derivative: Heptahydrate

CAS Registry Number: 7782-85-6

Molecular Formula: $\text{H}_{15}\text{Na}_2\text{O}_{11}\text{P}$

Molecular Weight: 268.065

Accurate Mass: 268.014736

Percentage Composition: H 5.64%; Na 17.15%; O 65.65%; P 11.55%

Use/Importance: Commercially available; triboluminescent

Physical Description: Colourless monoclinic prisms (H_2O at 40°)

Solubility: V. sol. H_2O

Other Data: $\Delta H_f^\circ -3821 \text{ kJ mol}^{-1}$. The prominent structural feature is a column of face- and edge-sharing $[\text{Na}_2(\text{OH}_2)_7]^{2(+)}$ octahedra H-bonded to tetrahedral $\text{PO}_3(\text{OH})$ groups. Mean Na-O 241.8, P-O 155.1 pm, OPO 102.7-114.2°. Loses $7\text{H}_2\text{O}$ at 60-140°

Aldrich: 22199-6

Fluka: 71647

Sigma: S9390

>>Derivative: Dodecahydrate

CAS Registry Number: 10039-32-4

Molecular Formula: $\text{H}_{25}\text{Na}_2\text{O}_{16}\text{P}$

Molecular Weight: 358.141

Accurate Mass: 358.067561

Percentage Composition: H 7.04%; Na 12.84%; O 71.48%; P 8.65%

Physical Description: Colourless efflorescent cryst. (H_2O) or white powder; β -form cryst. <30°, α -form at 30-35°

Solubility: Sol. H_2O (87 g per 100 cm^3 at 34°); insol. EtOH

Other Data: $\Delta H_f^\circ -5299 \text{ kJ mol}^{-1}$. β -Form consists of close-packed layers of $[\text{Na}(\text{OH}_2)_6]^{(+)}$ octahedra, 1/3 of which are replaced by PO_4 tetrahedra, with no interstitial H_2O molecules; the PO_4 tetrahedra each lie at the centre of a pseudo-hexagonal mesh of Na octahedra. Mean P-O 153.6 pm. Loses $12\text{H}_2\text{O}$ at $\leq 120^\circ$