



>>Entry Name: Sodium triphosphate (Na₅(P₃O₁₀))

ENTRY UNDER REVIEW

Synonym(s): Pentasodium triphosphate, 9Cl, 8Cl. Sodium tripolyphosphate

CAS Registry Number: 7758-29-4

Related CAS Registry Numbers(s): 14127-68-5 34275-69-9 35138-68-2 90906-71-1

Extra CAS Registry Numbers(s): 13573-18-7

Na₅(P₃O₁₀)

Molecular Formula: Na₅O₁₀P₃

Molecular Weight: 367.864

Accurate Mass: 367.819271

Percentage Composition: Na 31.25%; O 43.49%; P 25.26%

pentahydrates have also been claimed

Source/Synthesis: Manuf. from NaH₂PO₄ + Na₂HPO₄ (1:2) at <500°

Use/Importance: Important constituent of detergents, cleaning solns. for metals, corrosion inhibitors; also employed in the food industry

Physical Description: Solid

Melting Point: Mp 622° (incongr.)

Solubility: V. sol. H₂O (15 g per 100 cm³ at 25°; 33 g per 100 cm³ at 100°)

Other Data: Stabilises H₂O₂

Aldrich: 23850-3

Fluka: 72061

Sigma: T5041

>>Derivative: Hexahydrate

CAS Registry Number: 15091-98-2

Source/Synthesis: Synth. by cryst. of either Phase I or Phase II from H₂O, or by addition of NaCl (s) or Me₂CO or EtOH

Physical Description: Colourless plate-like cryst.

Solubility: V. sol. H₂O (27 g per 100 cm³ at 25°)

Other Data: Triclinic unit cell with P-O(P) 166, 162 pm, P_{1,3}-O 145-149 (terminal), P₂-O 152 pm. Dec. without melting at *ca.* 120°, but at 320° regenerates the anhydrous salt. Hydrol. spontaneously on long standing

>>Derivative: Octahydrate

Source/Synthesis: Claimed as the hydrate formed when soln. cryst. at <20°

Other Data: In air readily forms the hexahydrate

>>Derivative: Pentahydrate, mono-H₂O₂ complex

Physical Description: White powder

Other Data: Dec. at 125° losing all H₂O₂ and most H₂O

>>Derivative: Hydrate, tetra-H₂O₂ complex

Physical Description: Visc. white mass which slowly cryst. over P₄O₁₀

Other Data: Loses H₂O at 80-100° before dec.

>>Derivative: Hydrate, hexa-H₂O₂ complex

Physical Description: Visc. white mass which slowly cryst. over P₄O₁₀

Other Data: Loses H₂O at 80-100°, before dec.

>>Variant: Phase I-form

Molecular Formula: Na₅O₁₀P₃

Molecular Weight: 367.864

Accurate Mass: 367.819271

Source/Synthesis: Obt. by heating phase II at 550°; NaH₂PO₄ + 2Na₂HPO₄ heated at 540-580°; Na₄P₂O₇ + NaPO₃ at 550°; or by dehydration of hexahydrate at 550°

Use/Importance: This form *not* useful technically

Solubility: With H₂O, cakes and then dissolves slowly

Other Data: Transforms into phase II at *ca.* 420° depending on physical state. In absence of moisture indefinitely stable at r.t.