



>>Entry Name: Sodium triphosphate (Na<sub>5</sub>(P<sub>3</sub>O<sub>10</sub>))

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

Na<sub>5</sub>(P<sub>3</sub>O<sub>10</sub>)

Molecular Formula: Na<sub>5</sub>O<sub>10</sub>P<sub>3</sub>

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 NaH<sub>2</sub>PO<sub>4</sub> + Na<sub>2</sub>HPO<sub>4</sub> (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. H<sub>2</sub>O (15 g per 100 cm<sup>3</sup> at 25°; 33 g per 100 cm<sup>3</sup> at 100°)

Other Data: Stabilises H<sub>2</sub>O<sub>2</sub>

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 H<sub>2</sub>O, or by addition of NaCl (s) or Me<sub>2</sub>CO or EtOH

Physical Description: Colourless plate-like cryst.

Solubility: V. sol. H<sub>2</sub>O (27 g per 100 cm<sup>3</sup> at 25°)

Other Data: Triclinic unit cell with P-O(P) 166, 162 pm, P<sub>1,3</sub>-O 145-149 (terminal), P<sub>2</sub>-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-H<sub>2</sub>O<sub>2</sub> complex

Physical Description: White powder

Other Data: Dec. at 125° losing all H<sub>2</sub>O<sub>2</sub> and most H<sub>2</sub>O

>>Derivative: Hydrate, tetra-H<sub>2</sub>O<sub>2</sub> complex

Physical Description: Visc. white mass which slowly cryst. over P<sub>4</sub>O<sub>10</sub>

Other Data: Loses H<sub>2</sub>O at 80-100° before dec.

>>Derivative: Hydrate, hexa-H<sub>2</sub>O<sub>2</sub> complex

Physical Description: Visc. white mass which slowly cryst. over P<sub>4</sub>O<sub>10</sub>

Other Data: Loses H<sub>2</sub>O at 80-100°, before dec.

>>Variant: Phase I-form

Molecular Formula: Na<sub>5</sub>O<sub>10</sub>P<sub>3</sub>

Molecular Weight: 367.864

Accurate Mass: 367.819271

Source/Synthesis: Obt. by heating phase II at 550°; NaH<sub>2</sub>PO<sub>4</sub> + 2Na<sub>2</sub>HPO<sub>4</sub> heated at 540-580°; Na<sub>4</sub>P<sub>2</sub>O<sub>7</sub> + NaPO<sub>3</sub> at 550°; or by dehydration of hexahydrate at 550°

Use/Importance: This form *not* useful technically

Solubility: With H<sub>2</sub>O, 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.