



>>Entry Name: Sodium metaphosphate (NaPO_3), 9Cl, 8Cl
ENTRY UNDER REVIEW

CAS Registry Number: 10361-03-2

Related CAS Registry Numbers(s): 35270-09-8 60620-17-9 60734-85-2
 NaPO_3

Molecular Formula: NaO_3P

Molecular Weight: 101.962

Accurate Mass: 101.948274

Percentage Composition: Na 22.55%; O 47.07%; P 30.38%

Other Data: Monomeric form may be obt. by vaporisation

>>Variant: *I*-form

Synonym(s): Maddrell's salt

Molecular Formula: NaO_3P

Molecular Weight: 101.962

Accurate Mass: 101.948274

Percentage Composition: Na 22.55%; O 47.07%; P 30.38%

Source/Synthesis: Obt. by heating monohydrate of Sodium phosphate ($\text{Na}(\text{H}_2\text{PO}_4)$) [HTN10-P](#) at 250° in a closed system. High temp. form also from Trisodium metaphosphate ($\text{P}_3\text{O}_9^{3(-)}$) [HTM45-Y](#) at 625°. Also obt. from Sodium diphosphate ($\text{Na}_4(\text{P}_2\text{O}_7)$) [HTW34-S](#) in the presence of $[\text{NH}_4]\text{Cl}$ or $(\text{NH}_4)_2\text{SO}_4$ (but not the nitrate) at 250-330°. From $\text{NaNO}_3 + \text{H}_3\text{PO}_4$

Solubility: Insol. H_2O . Poorly sol. AcOH . V. sol. cold dil. H_2SO_4 or HNO_3

Other Data: When heated at >400°, → Trisodium metaphosphate ($\text{P}_3\text{O}_9^{3(-)}$) [HTM45-Y](#)

>>Variant: *II*-form

Synonym(s): Kurrol's salt

Molecular Formula: NaO_3P

Molecular Weight: 101.962

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Percentage Composition: Na 22.55%; O 47.07%; P 30.38%

both right-handed and left-handed spirals. In type A, PbO_{term} 147.9 pm, and $\text{P-O}_{\text{bridge}}$ 161.0 pm

[HTM98-Q](#) + Disodium phosphate [HTM78-K](#) at 800-900°

Physical Description: Colourless, fibrous or needle-like cryst.

Solubility: Insol. H_2O , but swells

Other Data: Forms A and B are interconvertible at 390-420°. Kurrol's salt A at 380-490° yields Maddrell's salt. Kurrol's salt B at 380-630° → Trisodium metaphosphate ($\text{P}_3\text{O}_9^{3(-)}$) [HTM45-Y](#), also obt. from form B at 490-630°. Moisture or pressure converts salt A into salt B

>>Variant: *III*-form

Synonym(s): Graham's salt

Molecular Formula: NaO_3P

Molecular Weight: 101.962

Accurate Mass: 101.948274

Percentage Composition: Na 22.55%; O 47.07%; P 30.38%

Source/Synthesis: Synth. from a mixture of polymeric sodium metaphosphate obt. in glassy form by quenching the liquefied salt

Physical Description: V. hygroscopic

Melting Point: Mp 628°

Solubility: Slowly sol. cold H_2O , but much more sol. warm H_2O

References: