



>>Entry Name: Yttrium phosphate (YPO₄)

Synonym(s): Yttrium(3+) phosphate (1:1), 9Cl, 8Cl. Yttrium(3+) orthophosphate

CAS Registry Number: 13990-54-0

Related CAS Registry Numbers(s): 34054-55-2

YPO₄

Molecular Formula: O₄PY

Molecular Weight: 183.877

Accurate Mass: 183.859271

Percentage Composition: O 34.80%; P 16.84%; Y 48.35%

Source/Synthesis: Synth. from YCl₃ + NaPO₃ at 200-1000°; Y(NO₃)₃ + NH₄H₂PO₄

Use/Importance: Ce activated YPO₄ is a fast-decay uv phosphor. Used in catalysis. Possible host for nuclear waste

Physical Description: Colourless solid

Melting Point: Mp 2150° (1995°; 1980°)

Other Data: Part. sol. H₃PO₄ yielding acid salts, incongr. sol. in H₂O. Ferromagnetic, *T_c* 360°

>>Derivative: Dihydrate

CAS Registry Number: 31512-68-2

Source/Synthesis: Synth. from YCl₃ + NH₄H₂PO₄ in H₂O; YCl₃ + H₃PO₄ aq. at pH 0.5-5 and 20-50°

Physical Description: Colourless cryst.

Other Data: Monoclinic. Weinschenkite struct. type. At higher temp., even in soln., becomes Monazite type. Loses H₂O at =273°

>>Derivative: Trihydrate

CAS Registry Number: 17069-92-0

Source/Synthesis: Synth. from Y(NO₃)₃ + H₃PO₄ aq.

Other Data: Tetragonal

>>Variant: Mineral-form

Synonym(s): Xenotime

CAS Registry Number: 13817-22-6

Molecular Formula: O₄PY

Molecular Weight: 183.877

Accurate Mass: 183.859271

Percentage Composition: O 34.80%; P 16.84%; Y 48.35%

Source/Synthesis: Commonly associated with Monazite, Zircon, or other minerals. Found in Europe (Germany, Austria, Italy) and N. America (California, Colorado, Mexican Gulf) as well as Brazil

Physical Description: Short to long, colourless to pale yellowish-green, yellow, or yellowish-brown, prisms

Other Data: V. stable to hot acids. Contains small amounts of other rare-earth elements eg. Er, La, and also Sc, Ce

References:

- Buyers, A.G. *et al.*, *J. Inorg. Nucl. Chem.*, 1958, **5**, 133, (*synth*)
Hezel, A. *et al.*, *Spectrochim. Acta*, 1966, **22**, 1949, (*ir, synth*)
Mooney, R.W. *et al.*, *J. Chem. Phys.*, 1967, **46**, 3364, (*ir, struct*)
Hezel, A. *et al.*, *J. Inorg. Nucl. Chem.*, 1967, **29**, 2085, (*synth, cryst struct*)
Tananaev, I.V. *et al.*, *Izv. Akad. Nauk SSSR, Neorg. Mater.*, 1969, **5**, 1402; *Inorg. Mater. (Engl. Transl.)*, 1969, **5**, 1197, (*synth*)
Armbruster, A., *J. Phys. Chem. Solids*, 1976, **37**, 321, (*ir*)
Bondar', I.A. *et al.*, *Zh. Neorg. Khim.*, 1976, **21**, 2045; *Russ. J. Inorg. Chem. (Engl. Transl.)*, 1976, **21**, 1126, (*synth*)
Hikichi, Y. *et al.*, *Bull. Chem. Soc. Jpn.*, 1978, **51**, 3645, (*synth*)
Yurchenko, E.N. *et al.*, *Izv. Akad. Nauk SSSR, Neorg. Mater.*, 1978, **14**, 2038; *Inorg. Mater. (Engl. Transl.)*, 1978, **14**, 1586, (*ir, Raman*)
Begun, G.M. *et al.*, *J. Raman Spectrosc.*, 1981, **11**, 273, (*synth, Raman*)
Milligan, W.O. *et al.*, *Inorg. Chim. Acta*, 1982, **60**, 39, (*cryst struct*)
Agrawal, D.K. *et al.*, *Mater. Res. Bull.*, 1985, **20**, 697, (*ir, Raman, struct*)
Eshchenko, L.S. *et al.*, *Zh. Neorg. Khim.*, 1985, **30**, 1377; *Russ. J. Inorg. Chem. (Engl. Transl.)*, 1985, **30**, 785, (*synth, morphology*)
Turner, G.L. *et al.*, *J. Magn. Reson.*, 1986, **70**, 408, (*P-31 nmr*)
Prabhakar, S. *et al.*, *Chem. Phys. Lett.*, 1987, **139**, 96, (*P-31 nmr*)
Lazarevski, E. *et al.*, *Izv. Akad. Nauk SSSR, Neorg. Mater.*, 1987, **23**, 481; *Inorg. Mater. (Engl. Transl.)*, 1987, **23**, 422, (*synth*)