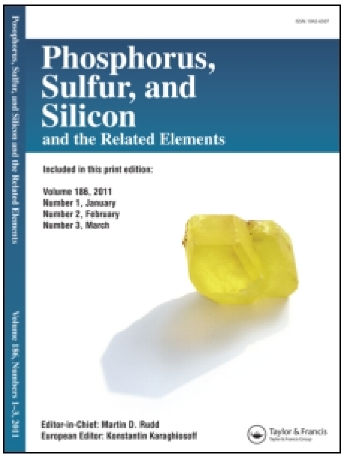

Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

The Ring Acid, $H_6P_6O_{12}$ and Ring Acid, $H_4P_4O_{10}$ and Their Salts

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To cite this Article Ebert, M. and Nassler, J.(1989) 'The Ring Acid, $H_6P_6O_{12}$ and Ring Acid, $H_4P_4O_{10}$ and Their Salts', Phosphorus, Sulfur, and Silicon and the Related Elements, 41: 3, 462

To link to this Article: DOI: 10.1080/10426508908039741

URL: http://dx.doi.org/10.1080/10426508908039741

THE $(\overset{3}{P})_6$ RING ACID, $H_6P_6O_{12}$ AND $(-\overset{4}{P}-\overset{4}{P}-O-)_2$ RING ACID, $H_4P_4O_{10}$ AND THEIR SALTS

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Abstract The hydrated salts of the acid $H_6P_6O_{12}$, $Rb_6P_6O \cdot aq$ and $M_3P_6O_{12} \cdot aq$ (M = Ca, Sr, Ba), that have so far been unknown, have been prepared and studied by X-ray methods, thermal analysis and molecular spectroscopy. It has been found that the anion structure exhibits a chair form with the D_{3d} symmetry. All the salts are stable at laboratory temperature and are completely decomposed on prolonged heating to 80°C prior to complete dehydration. The newly prepared salts of the acid $H_4P_4O_{10}$ involve $Cs_4P_4O_{10} \cdot 1.5\ H_2O$, $Tl_4P_4O_{10}$, $M_2P_4O_{10} \cdot x\ H_2O$ (M = Cu, Ni, Co; x = 10, 2, 6, respectively), $Na_2MP_4O_{10} \cdot x\ H_2O$ (M = Cu, Ni, Co; x = 8, 8, 4, respectively). They have been studied using X-ray methods, thermal analysis, molecular and reflectance spectra and the magnetic susceptibility. The dehydration of the salts starts at 30 to 40°C and ends by complete decomposition before the completion of dehydration at 150°C. The anion structure for the salt $Cs_4P_4O_{10}$ in the crystalline state has a chair form with C_{2h} symmetry. However, the anion structure in aqueous solutions approaches a planar arrangement with the D_{2h} symmetry.