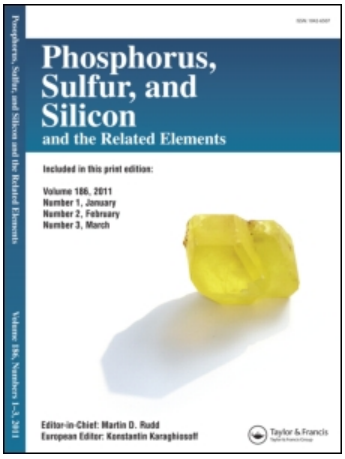

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Cyclohexaphosphates of Alcaline Metals

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CYCLOHEXAPHOSPHATES OF ALCALINE METALS

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The fast progress of chemistry of condensed phosphates resulted in a great attention to this kind of inorganic polymers all over the world. This paper reports preparation by ion exchange with lithium salt (1), solubility in water, some structural data and thermal transformation of alcaline metals cyclohexaphosphates (CHP). The crystal structures of all the compounds (table) were determined ($Na_6P_6O_{18}\cdot 6H_2O$ one has been described previously (2)). The crystals are built up of CHP-rings and alcaline metal (M^I) polyhedra, so that during the transition from Li to Cs coordination number (c.n.) of M^I increases from 4 to 9. In crystal $Li_6P_6O_{18}\cdot 5H_2O$ only 4 water molecules are coordinated by metal, moreover, there are channels where 2 additional water molecules may be placed. $Rb_6P_6O_{18}\cdot 6H_2O$ and $Cs_6P_6O_{18}\cdot 6H_2O$ were found to be isomorphous, as well as anhydrous $K_6P_6O_{18}$ and $Rb_6P_6O_{18}$.

TABLE

X-ray crystallographic CHP data

Compound	Sp.gr	a,Å	b,Å	c,Å	α,gr	β,gr	γ,gr	c.n.
$Li_6P_6O_{18}\cdot 5H_2O$	$P\bar{1}$	9,490	8,069	7,810	107,2	113,8	65,19	4
$Na_6P_6O_{18}\cdot 6H_2O$	Ccmm	11,58	18,54	10,48				6
$K_6P_6O_{18}$	Pa3	15,74						6
$K_6P_6O_{18}\cdot 3H_2O$	$P2_I/m$	6,803	17,45	9,195		107,2		7,8
$Rb_6P_6O_{18}\cdot 6H_2O$	$P\bar{1}$	9,626	9,623	8,698	111,1	107,9	60,24	9
$Cs_6P_6O_{18}\cdot 6H_2O$	$P\bar{1}$	9,881	9,890	9,006	111,5	106,6	60,07	9
$Rb_6P_6O_{18}$	-	16,23						(?)
$Cs_6P_6O_{18}$	-	25,16						(?)

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