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Supramolecular Assembly of Metal Phosphates

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Abstract:

- Synthesis of Alumina/Zinc Phosphates
- Crystallographic Properties: Coordination of Al/F/P tetrahedra and their Unit Cell
- Hydrothermal Synthesis: Mechanism

Synthesis of Corner Shared Alumina/Zinc Phosphate Tetrahedra	Asymmetric Unit	Polyhedral Connectivity	Supramolecular Arrangement	Mechanism of Hydrothermal Synthesis															
<p>Al(PO₄)₂[NH₄][1,2-DAPH₂]</p>				<p>Mechanism of Hydrothermal Synthesis</p> <p>Adopted from Reference 1.</p>															
<p>[DMAH₂]₉[Al₆F₆(HPO₄)₉(H₂PO₄)₃]</p>																			
<p>Zn(HPO₄)₂(Py)</p>																			
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<p>AlFPO₄[DMA⁺]</p>																			
				<p>Crystallographic Data</p> <table border="1"> <thead> <tr> <th>Chemical Formula</th> <th>Crystal System & Space Group</th> <th>Unit Cell</th> </tr> </thead> <tbody> <tr> <td>Al(PO₄)₂[NH₄][1,2-DAPH₂]</td> <td>Orthorhombic [P c c n]</td> <td>a=8.27 b=8.67 c=16.80 α=β=γ=90°</td> </tr> <tr> <td>[DMAH₂]₉[Al₆F₆(HPO₄)₉(H₂PO₄)₃]</td> <td>Orthorhombic [P 21 21 21]</td> <td>a=15.8843 b=20.3281 c=22.1032 α=β=γ=90°</td> </tr> <tr> <td>Zn(HPO₄)₂(Py)</td> <td>Monoclinic [P 1 21 1]</td> <td>a=7.7624 b=5.3915 c=9.1195 β=91.936°</td> </tr> <tr> <td>[DMAH₂]₃[Zn₂(HPO₄)₃(H₂PO₄)₄]</td> <td>Triclinic [P (-1)]</td> <td>a=8.2391 b=11.2738 c=12.2587 α=89.700° β=87.613° γ=87.881°</td> </tr> </tbody> </table>	Chemical Formula	Crystal System & Space Group	Unit Cell	Al(PO ₄) ₂ [NH ₄][1,2-DAPH ₂]	Orthorhombic [P c c n]	a=8.27 b=8.67 c=16.80 α=β=γ=90°	[DMAH ₂] ₉ [Al ₆ F ₆ (HPO ₄) ₉ (H ₂ PO ₄) ₃]	Orthorhombic [P 21 21 21]	a=15.8843 b=20.3281 c=22.1032 α=β=γ=90°	Zn(HPO ₄) ₂ (Py)	Monoclinic [P 1 21 1]	a=7.7624 b=5.3915 c=9.1195 β=91.936°	[DMAH ₂] ₃ [Zn ₂ (HPO ₄) ₃ (H ₂ PO ₄) ₄]	Triclinic [P (-1)]	a=8.2391 b=11.2738 c=12.2587 α=89.700° β=87.613° γ=87.881°
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				<p>Conclusion</p> <p>Supramolecular assembled AlPO₄ & ZnPO₄</p> <p>↳ "Zeolitic" Material</p>															
				<p>References</p> <p>1. Senthilkumar, N., Vivek, E., Shankar, M., Meena, M., Vimalan, M. and Potheher, I., 2021. <i>Synthesis of ZnO nanorods by one step microwave-assisted hydrothermal route for electronic device applications.</i></p>															