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Diffraction methods for investigation of the real structure of langasite family

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Abstract: Structure elucidation and aqueous speciation of water-soluble M₅SₓM= (Mo,W) clusters bearing hydroxypropyl diphosphine ligands

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Abstract: The chemistry of water-soluble transition-metal complexes containing phosphine ligands is of interest because of the potential usefulness of these complexes in biphosphonic (aqueous-organic) catalysis and biomedicine. Two-phase catalysis can solve basic problems in homogeneous catalysis such as the separation and further recycling of the catalyst, making these processes environmentally friendly.

In particular, phosphines with hydroxyalkyl groups such as 1,2-bis(bis(hydroxypropyl)-phosphino)ethane (dhppe) have enabled the development of a wide spectrum of water-soluble transition/organometallic complexes.

Here we present the structural characterization of new group six trinuclear [M₅SₓX₃(dhppe)], (M=Mo, W; X=Cl, Br) clusters combining x-ray diffraction and spectroscopic techniques. A water speciation study is also shown. Depending on pH, new cluster structures are obtained as a result of dhppe ligand deprotonation.