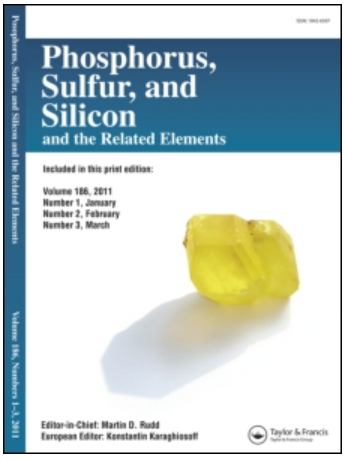

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A New Heptanuclear Tin Cluster Containing Sulfur and Oxygen in the Framework

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A NEW HEPTANUCLEAR TIN CLUSTER CONTAINING SULFUR AND OXYGEN IN THE FRAMEWORK

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Abstract We have recently reported that new structural forms having the cube, $(n\text{-BuSn(O)O}_2\text{PPh}_2)_4$, and oxygen-capped, $[(n\text{-BuSn(OH)O}_2\text{PPh}_2)_3\text{O}][\text{O}_2\text{PPh}_2]$, formulations can be prepared by the reaction of n-butylstannonic acid with the corresponding diorganophosphinic acid. In new work exploring the effects of the bulky mesityl group bound to phosphorus, a cube formulation was also obtained. When n-butylstannonic acid was reacted with dicyclohexylphosphinic acid in the presence of nitric acid an oxygen-capped cluster having nitrate as the anion was obtained, demonstrating that the phosphinate anion is not required to stabilize the o-capped cation. In an attempt to generate similar structural forms, with sulfur replacing oxygen in the framework, the reaction of n-butylstannonic acid with diphenylphosphine oxide in the presence of elemental sulfur has been explored. From this reaction, a new structural form, containing seven hexacoordinate tin atoms and incorporating sulfur into the framework, $[(n\text{-BuSn(S)O}_2\text{PPh}_2)_3\text{O}]_2\text{Sn}$, was obtained in a mixture of products. A comparison of the crystal structures of the three compounds indicates that the new form has structural features in common with both the cube and the o-capped cluster.