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Ligational behaviour of thiometallate [$(MS_4)^{2-}$, (M = Mo, W)] ligands towards Ni(II) in the presence of aliphatic diamines

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Thioanions of the group VI metals are unusual ligands as they are purely inorganic in nature and have been extensively used in inorganic synthesis. These efforts have resulted in the synthesis and the structural characterization of a variety of sulphur-bridged homo and hetero bi, tri, tetra and multimetallic complexes [1]. The continuing research in this area is mainly due to the importance of such complexes in materials science and in hydrodesulphurization (HDS) catalysis [2,3]. It has been observed that HDS activity is enhanced when Ni or Co is added to Mo or W based catalysts and also that the active phase contains M¢Mo-S (M¢= Ni or Co) units. We have studied the complex formation reactions of Ni(II) with thiometallates in the presence of aliphatic diamines like 1,2-diaminoethane, 1,2-diaminopropane and 1,3-diaminopropane. Herein, we wish to report the synthesis and characterization of neutral hexacoordinated mixed ligand Ni complexes of the general formula $[L_2Ni(MS_4)]$ **1** (L = aliphatic diamine, M = Mo, W) and another series of complexes $[L_3Ni][MS_4]$ **2** (L = aliphatic diamine, M = Mo, W). These complexes can be thermally decomposed to provide mixed metal sulphides. The details of the synthetic methodology and the procedures employed for characterization of **1** and **2** as well as the thermal decomposition pathways are discussed.

References

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