

PREPARATION AND STRUCTURAL CHARACTERIZATION OF BIMETALLIC IRON-NICKEL & RUTHENIUM-NICKEL CARBIDO CLUSTER COMPLEXES. Sumit Saha,

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The reaction of the pentairon carbide carbonyl cluster $\text{Fe}_5(\text{CO})_{15}(\mu_5\text{-C})$ with $\text{Ni}(\text{COD})_2$ in acetonitrile solvent at room temperature afforded the new bimetallic iron-nickel cluster complex $\text{Fe}_5\text{Ni}(\text{NCMe})(\text{CO})_{15}(\mu_6\text{-C})$, **1**. Compound **1** reacts with CO and ammonia gas by loss of its acetonitrile ligand to yield $\text{Fe}_5\text{Ni}(\text{CO})_{16}(\mu_6\text{-C})$ and $\text{Fe}_5\text{Ni}(\text{NH}_3)(\text{CO})_{15}(\mu_6\text{-C})$ respectively. Pyrolysis of compound **1** in acetonitrile solvent furnishes the square pyramidal Fe_4Ni complex $\text{Fe}_4\text{Ni}(\text{NCMe})_2(\text{CO})_{12}(\mu_5\text{-C})$, **2**. Compound **2** readily converts to $\text{Fe}_4\text{Ni}(\text{NCMe})(\text{CO})_{13}(\mu_5\text{-C})$, **3**, by losing one of its acetonitrile ligands. Under an atmosphere of CO at 110 °C, compounds **2** and **3** both form the octahedral Fe_4Ni_2 complex $\text{Fe}_4\text{Ni}_2(\text{CO})_{15}(\mu_6\text{-C})$, **4**. The reaction of the pentaruthenium carbide carbonyl cluster $\text{Ru}_5(\text{CO})_{15}(\mu_5\text{-C})$ with $\text{Ni}(\text{COD})_2$ in acetonitrile solvent at room temperature afforded the new bimetallic ruthenium-nickel cluster complex $\text{Ru}_5\text{Ni}(\text{NCMe})(\text{CO})_{15}(\mu_6\text{-C})$, **5**. Compound **5** reacts with CO and ammonia gas by loss of its acetonitrile ligand to yield the complexes $\text{Ru}_5\text{Ni}(\text{CO})_{16}(\mu_6\text{-C})$ and $\text{Ru}_5\text{Ni}(\text{NH}_3)(\text{CO})_{15}(\mu_6\text{-C})$ respectively. The structures and reactivity of these complexes will be presented.