

# Nanoscale Single Molecules as Catalysts for Growth of Carbon Nanostructure

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A family of Au and Ru nano-scale clusters of clusters have been developed by a novel dendrimer route of synthesis. These dendrimer-based giant molecules as quantum dots provide unique advantages, as for example, in the preparation of monodispersed particles with well-defined molecular structures and surface functionalities. In contrast to the 'magic' number synthesis of colloids wherein metal particles are stabilised by a 'passivating' external layer of organic ligands, We have used large internal organic scaffolds such as [DAB-dendr-[N(CH<sub>2</sub>PPh<sub>2</sub>)<sub>2</sub>]<sub>16</sub> to construct an array of metal clusters, thereby forming nano-scale self-ordering molecules for many applications. One example is that a Ru cluster and clusters constructed in this way has been successfully employed as catalyst for growth of carbon nanohorns.