

Energy-level splitting of ligand-stabilized Au₅₅ clusters observed by scanning tunneling spectroscopy

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A monolayer of Au₅₅ clusters stabilized by [P(C₆H₅)₃]₁₂Cl₆ ligands was investigated at 7 K using a low-temperature ultrahigh vacuum scanning tunneling microscope. The topography of single clusters shows the actual arrangement of the C₆H₅ rings of ligand molecules. Characteristic charge-quantization phenomena usually obtained for metal particles were observed by current–voltage measurements. Spectroscopic data acquired at different locations within a cluster reveal energy levels with average spacing of 170 meV which can be attributed to the Au₅₅ core.