

High-temperature needle-sensor investigations on thin Au₅₅ layers

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The rearrangement of layers of ligand-stabilized Au₅₅ clusters, deposited on graphite and mica substrates, was imaged during heating in ultrahigh vacuum. No thermally induced rearrangement of the clusters was observed below a certain decomposition temperature. Significant modifications of the layer structure were found on both substrates beyond that temperature. The observed critical temperature agrees fairly well with the decomposition temperature obtained from calorimetry measurements on solutions and pellets. At higher temperatures the cluster decomposition and aggregation processes differ significantly for the two substrates. This is attributed to a much stronger cluster–substrate interaction for mica in comparison to graphite.