

SIZE-DEPENDENT FERROMAGNETISM IN ASSEMBLIES OF PALLADIUM NANOCLUSTERS

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As bulk palladium is a paramagnetic metal. While going down to nanoscale, the increased surface to volume ratio in nanoparticles lead to size-dependent properties, e.g. ferromagnetism in Pd nanoparticles, which was first reported by Taniyama et al. [1]. These effects have mostly been exhibited by palladium thinfilms as well as fine nanoparticles. We have investigated bare palladium nanocluster assemblies and are able to demonstrate a size dependent ferromagnetic behavior in these particles. This is shown by the characteristic ferromagnetic hysteresis with the temperature dependent saturation magnetization, remanence and coercivity of palladium nanocluster aggregates. The temperature dependence of the saturation magnetization, remanence and coercivity of Pd nanoclusters were measured using a ultra-high-sensitive magnetometer based on a superconducting quantum interference device (SQUID) and the morphology of the samples was analysed by transmission electron microscopy (TEM).

[1] T. Taniyama, E. Ohta, and T. Sato, [Europhys. Lett. 38, 195 \(1997\)](#).