

The aim of the experiment was to investigate the hcp (hexagonal closed-packed) - fcc (face-centered cubic) phase transition of cobalt nanoclusters in silica upon heating in vacuo: this transition, that in the Co bulk phase occurs at $T_0=420\text{C}$ (at normal pressure), is expected to depend on the cluster size as well as on the cluster-matrix interaction (see the proposal for details). This experiment was a continuation of the exp. HS 1866, during which a relevant part of the experimental time was dedicated to the experimental setup ad to test the furnace. With respect to the first experiment, the new results obtained in this one are:

- Only at very high temperature ($T=1100\text{ C}$, about 700 C higher than T_0) the fcc is the only phase detected by grazing incidence x-ray diffraction. For temperature in the range 900 C - 1000 C both fcc and hcp phases are present.
- The hcp->fcc transition is size-dependent: smaller is the crystalline cluster, higher is its transition temperature.
- The thermal expansion of hcp clusters is not isotropic: the variation of c is sensibly larger than the variation on a .

Part of the results is reported in a paper by C. Maurizio et al., submitted to Mat. Sci. Eng. C.