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Synthesis and characterization of size-selected Ag nanoparticles with icosahedral shape[1] MIGUEL GRACIA-PINILLA, EDUARDO PEREZ-TIJERINA, SERGIO MEJIA-ROSALES, Universidad Autonoma de Nuevo Leon, MIGUEL JOSE-YACAMAN, University of Texas at Austin — We report the synthesis of Ag nanoparticles, produced by the technique of Inert Gas Aggregation, which allows a very precise selection of the nanoparticle sizes and deviations. We found the optimal experimental conditions to synthesize nanoparticles of six different sizes: 1.3±0.24, 1.7±0.35, 2.5±0.44, 3.7±0.41, 4.5±0.88, and 5.5±0.24 nm. With this, we were able to investigate the dependence of the size of the nanoparticles on the synthesis parameters. Our data suggest that the aggregation of clusters (dimmers, trimer, etc) inside of the nanocluster source is the predominant physical mechanism for the formation of the nanoparticles. In order to preserve their structural and morphological properties, the impact energy of the clusters landing into the substrate was controlled; the acceleration energy of the nanoparticles was around 0.1 eV/atom, assuring a deposition in a soft landing fashion. HRTEM and HAADF-STEM images showed that the particles were icosahedral.

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