

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Stable highly symmetric dopant encapsulated binary clusters¹ PETER LIEVENS, SVEN NEUKERMANS, EWALD JANSSENS, Laboratory of Solid State Physics and Magnetism, K.U.Leuven, Celestijnenlaan 200D, B-3001 Leuven, Belgium — While clusters composed of rare gas atoms exhibit enhanced stabilities for high symmetry geometries, magic numbers in simple metal clusters are determined by the number of delocalized valence electrons. Altering the composition of binary clusters allows to tailor independently the cluster geometry (number of atoms) and electronic properties (number of delocalized electrons). We produce beams of binary clusters with a dual-target dual-laser vaporization source. Size and composition dependent stability fluctuations are investigated with photofragmentation and mass spectrometry, and ionization energies with threshold laser ionization spectroscopy. We recently studied clusters of noble metals doped with transition metal atoms, and of group IVa elements doped with di- and trivalent metal atoms. Evidence is presented for the existence of combined closures of shells of atoms and shells of electrons for specific binary species. Phenomenological interpretations of new electronic shell closures are compared with DFT calculations of their geometry and electronic structure.

¹This work was supported by the Fund for Scientific Research Flanders (FWO), the Flemish Concerted Action (GOA) program, and the Belgian Interuniversity Poles of Attraction (IAP) program.

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Date submitted: 30 Nov 2005

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