

MATRL 265 Class 4: Metals clusters in the gas phase etc.

Metal clusters made in supersonic beams have been studied by a number of techniques. Mass spectrometry suggests the occurrence of magic numbers, and even superclusters, that have been explained using shell models. Mass-selection of clusters allows a number of experiments to be performed, such as the acquisition of photoelectron spectra from mass-selected clusters.

Key concepts Supersonic cluster sources, mass selection, ionization energies, magic numbers, shell models and jellium, insulator-metal transitions, smearing of energy levels, Coulomb stairs.

1. W. A. de Heer, The physics of simple metal clusters: experimental aspects and simple models, *Rev. Mod. Phys.* **65** (1993) 611. ([DOI](#)). [66 pages, no need to print this out].
2. C. N. R. Rao, G. U. Kulkarni, P. J. Thomas, and P. P. Edwards, Metal nanoparticles and their assemblies, *Chem. Soc. Rev.* **29** (2000) 27. ([DOI](#))