

Observation of 3d metal ion charge state distributions in the Dresden EBIT

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Ion charge states of 3d metal ions in the electron beam of the Dresden electron beam ion trap (EBIT), a room-temperature EBIT, are determined by x-ray spectroscopy. It is shown that ions of highest charge states as bare nuclei and hydrogen- and helium-like ions can be produced with ion densities of about 10^5 cm^{-3} up to 10^8 cm^{-3} in the trap. The Dresden EBIT operates at a typical working gas pressure region of 10^{-8} mbar down to 10^{-10} mbar. Thus the influence of the realized working gas pressure on the derived ion charge state distribution is investigated by model calculations. © 2002 American Institute of Physics. [DOI: 10.1063/1.1430038]