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Nonequilibrium magnesium complexes formed in helium nanodroplets JOSEF TIGGESBÄUMKER, ANDREAS PRZYSTAWIK, SEBASTIAN GÖDE, KARL-HEINZ MEIWES-BROER, Institute of Physics, University of Rostock, 18051 Rostock, Germany — Doping helium droplets with alkaline earth atoms is an interesting tool to investigate the interaction with the superfluid helium. Magnesium is a corner case regarding the degree of solvation in helium [1,2] which may enable the detection of quantized vortices in helium droplets. In this contribution we add another facet to the discussion. The absorption of helium droplets doped with magnesium atoms is measured with resonant two-photon ionization at different combinations of droplet size and the number of doped Mg atoms. This enables the unambiguous identification of the absorption of an isolated atom inside the droplet centered around 279 nm. When increasing the Mg content of the droplet we find evidence for the formation of metastable, weakly bound Mg complexes. After excitation of such a complex it collapses to a Mg cluster on a timescale of 20 ps.
[1] J. Reho *et al.*, J. Chem. Phys. **112**, 8409 (2000)
[2] Y. Ren and V.V. Kresin, Phys. Rev. A **76**, 043204 (2007)

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