Abstract Submitted
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Growing Ag Clusters in Superfluid He Droplets[1] LUIS F. GOMEZ, Department of Chemistry, University of Southern California, Los Angeles, CA, EVGENY LOGINOV, SICPA SA, Prilly, Switzerland, NAIHAO CHIANG, AVIK HALDER, NICHOLAS GUGGEMOS, VITALY KRESIN, Department of Physics, University of Southern California, Los Angeles, CA, ANDREY F. VILESOV, Department of Chemistry and Department of Physics, University of Southern California, Los Angeles, CA — Here we report on the growth and study of Ag clusters, ranging in size from 10 to 10^7 atoms, in a beam of superfluid He droplets. The droplets were used to capture Ag atoms from a hot oven, which then recombined in the interior of the droplet at sub-Kelvin temperature. The structure of the obtained Ag clusters was studied in situ via laser spectroscopy of their plasmon resonance. Furthermore, the clusters were surface-deposited and studied via transmission electron microscopy. The images have provided for a measure of the cluster flux and size distribution, which is in good agreement with an estimate based on the energy balance of Ag cluster growth in He droplets. The images also reveal an astounding change in shape of the deposited clusters to elongated and track-shaped with increased droplet size. This is ascribed to the formation of vortices within the He droplets whose cores are traced by the Ag atoms and clusters. The possible formation mechanism of the vortices and their stability will also be discussed.

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