

Abstract Submitted
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Ion energy distribution functions of ions hitting nanoparticles in plasmas¹ UWE KORTSHAGEN, FEDERICO GALLI, MEENAKSHI MAMUNURU, University of Minnesota — Nonthermal plasmas are interesting sources for the synthesis of nanoparticles. Among the unique features of nonthermal plasmas is that high quality nanocrystals, even of high melting point materials, can be produced in a low temperature environment. It is believed that the energy distribution of ions hitting the nanoparticles during nanoparticle growth is an essential parameter for the formation of high quality nanocrystals. In this presentation, we discuss results of a molecular dynamics-Monte Carlo simulation, which simulates the motion of ions around a nanoparticle and their impact on the nanocrystal surface. We are studying the cases of both a pure argon plasma and an argon-hydrogen plasma. An interesting interplay between different ion species in the plasma is found. We show that in certain ranges of discharge pressure, nanoparticles are exposed to a strong flux of low energy ions, which may be responsible for the restructuring of the nanoparticle surfaces during growth and for the formation of rather defect free nanocrystals.

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