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Negative ions and nanoparticle formation in low pressure rf plasmas JOHANNES BERNDT, GREMI Universite d'Orleans, E. KOVACEVIC, G. WATTIEAUX, L. BOUFENDI, GREMI, Universite d'Orleans, France — The formation of nanoparticles in low temperature and low pressure plasmas is a complex process involving a great variety of different neutral and charged species. The understanding of the underlying mechanisms is an essential requirement for a controlled initiation or suppression of nanoparticle growth. In this contribution we focus on nanoparticle formation in a capacitively coupled discharge operated in different mixtures of noble gases with either hydrocarbons or silane as precursor gas. Despite the complexity of nanoparticle formation and its dependence on the specific chemistry, it is generally believed that negative ions play a crucial role in the early stage of this process. The role of negative ions for the nucleation of nanoparticles and their impact on the discharge characteristics (electron density, self bias etc.) is investigated both experimentally and theoretically. The investigations are performed for continuous and pulsed discharges.

Johannes Berndt
GREMI Universite d'Orleans

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