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Plasma physical and plasma chemical aspects of nanoparticle formation in hydrocarbon plasmas JOHANNES BERNDT, EVA KOVACEVIC, GREMI, University of Orleans, France, ILIJA STEFANOVIC, Institut of Physics, Belgrade, Serbia — Low temperature plasmas are a breeding place for a great variety of different species, that can be used for different applications as the deposition of thin films or the the synthesis of nanoparticles and nanocomposites. However the distinctive nonequilibrium character of theses plasmas makes their understanding and their control a rather challenging task. The solution of this task is in addition hampered by the fact that decisive factors like cross sections for electron impact processes or rate coefficients for molecule-molecule reactions are very often completely unknown. In particular reactions including the walls of the plasma reactor are difficult to account for since they depend on the nature of the involved molecules and on the nature of the wall itself. This contribution deals with two simple approaches to control plasma chemical processes in a reactive low temperature plasma: the variation of the diffusion length and the pulsing of the discharge. The contribution will focus on experiments performed in rf low pressure hydrocarbon plasmas with special emphasis on the influence of plasma physical and plasma chemical processes on the formation and properties of nanoparticles.

Johannes Berndt
GREMI, University of Orleans, France

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