DUSTY PLASMA AND NANOTECHNOLOGY

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Dust particle formation in plasmas is one of the most studied subjects during the last two decades. Research conducted on dusty plasmas was focusing on understanding of the induced problems in low-pressure plasma tools and surface processing technologies. These studies on physics and chemistry of dusty plasmas resulted in the discovery of fascinating scientific and technological domains. It is still an important item with regard to the nanotechnologies development. The lack of knowledge on the impact of the nanoparticles on human health makes also this subject of prime importance. The aim of this contribution is to give an overview on the main aspects of the problem. The first one concerns the nucleation and growth mechanisms of the nanoparticles occurring in low pressure plasmas underlining the evolution of the discharge and plasma characteristics. The thermodynamical aspects of these processes will be also discussed. In the second part the dust particle trapping and dynamics in the gas phase will be presented. The third part of the contribution is devoted to the use of the nanoparticles in different industrial domains such as nanostructured thin layers deposition, synthesis of nanoparticles for cosmetics and bio-medical needs. Finally, safety aspects induced by the development of nanotechnologies will be addressed.

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