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LOW TEMPERATURE PLASMAS FOR CONDUCTIVE CARBONS AND MULTIMATERIALS

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Low-temperature plasmas are used in a wide variety of applications ranging from the production of astro-analogs, interface systems and renewable energy systems, to applications in biomedicine, electronics, micromaterial processing and photovoltaics. The use concerns mostly the functionalization, activation, cleaning and etching of surfaces and the deposition of thin films. In addition, an important aspect of basic plasma research concerns the synthesis of nanoparticles in the bulk of the plasma and the growth of 2D and 3D structures on different surfaces.

Despite the successful use of low-temperature plasmas in industrial applications, the tailored synthesis of materials remains an exciting challenge that requires a deeper understanding of the underlying plasma chemical and plasma physical processes in all stages of the process. An Important factor in this context are the impurities, or for example, the conditions of the walls of the plasma reactor and their great influence on the results of the material synthesis.

Characterization and monitoring of the plasmas by means of e.g. optical emission spectroscopy, plasma (ion) mass spectroscopy or microwave interferometry is therefore an indispensable prerequisite for the controlled production, *leading to tailored conductive carbon materials (2d and 3D), or multimaterials as for example MoS2/graphene structures for cells and Al ion batteries.*

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