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Ionizing and non-ionizing radiation in nanoparticle synthesis

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Materials consisting of nanometer-sized particles have drawn substantial attention in wide range of research fields, mostly for their various unique properties originating from their small size or related high specific surface area. For this reason, the nanoscale materials have been considered for many applications (e.g. as phosphors, catalysts or sorbents).
This talk covers brief history and recent development of nanoparticle synthesis using various types of ionizing (IR) and UV radiations. The synthesis of various inorganic compounds using IR or UV light represents very promising research and technological field. Radiation-induced processes have some advantages over common chemical methods: they are mostly independent of temperature and they yield material of high purity, with narrow size distribution of particles. The radiation methods has been successfully tested for preparation of variety of nano-scale compounds, namely metals, metal alloys and core-shell systems, metal oxides, garnets, various heterostructures and nanocomposites.

Primary author: Dr ČUBA, Václav (CTU in Prague - FNSPE, Department of Nuclear Chemistry)

Presenter: Dr ČUBA, Václav (CTU in Prague - FNSPE, Department of Nuclear Chemistry)

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