Cluster beam deposition: a tool for nanoscale science and technology

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Abstract

Gas phase nanoparticle production, manipulation and deposition is of primary importance for the synthesis of nanostructured and nanocomposite materials and for the development of industrial processes based on nanotechnology. In this presentation we will present and discuss this approach, introducing cluster sources, nanoparticle particle formation and growth mechanisms and the use of aerodynamic focusing methods that are coupled with supersonic expansions to obtain high intensity cluster beams with a control on nanoparticle mass and spatial distribution [1]. The implication of this technique for the synthesis of nanostructured and nanocomposite materials will be presented and applications will be highlighted [1, 2]. The recent results on the production of polymer supported Micro-Electrode Array device will be also discussed in dept.

[1] K. Wegner *et al.*, J. Phys. D: Appl. Phys. **39**, R439 (2006);
[2] L. Ravagnan *et al.*, arXiv:0902.0228