Large-Area Nanoparticle Deposition Using Gas Aggregation Process

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Introduction: The continuous growth of academic interest for nano-fabrication topic since the mid-90‘s is also observed in the steady growth of granted patents and gives hope for a future potential industrial applicability.

Purpose: This approach allows high-content ZnO Nano rods to grow uniformly over not only a few fibers, a fiber bundle using the electro deposition process as an effective low-temperature synthesis method.

Methods: Gas aggregation setup established in collaboration between TU Dresden (IFE) and FEP consists in a gas-flow-sputtering nanoparticles source (Hollow cathode), a PECVD matrix deposition source, an Etching unit, and a 4th station for possible extension (Magnetron Sputtering Matrix deposition or CNT deposition by ESI).The originality of this setup lies in its dimensions (aggregation volume ≈ 100L; up to 3slm gas flow) Adjustable slit opening between aggregation and deposition zones, allowing a 12mm wide Plane jet in the dynamic vacuum setup, translating in up to 20mm wide nanoparticle deposition.

Conclusion: After presenting the technical setup and its operation principle, this work will show obtained results for the deposition of Ag NP – SiOx Metal-polymer nanocomposites (Deposition rate 15…60nm/min).

Biography:

Harry Nizard research focuses on plasma processes, fluids and plasma interactions with substrate's surface, in order to develop more efficient processes and improve the deposition growth rate of thin films used in microelectronics, photovoltaics, etc.My research topics are centred on semiconductors, solar cells and green applications (photocatalysis, plasma treatments),and plasma-surface interactions.. .

Publication of speakers:

1. 1. Optical Properties of Metal-Dielectric Nanocomposite Coatings Obtained by Gas Phase Condensation (GPC) and PECVD processes

2. Influence of discharge and jet flow coupling on atmospheric pressure plasma homogeneity

3. Point-to-Plane Discharge on an Anisotropic Ceramic-Matrix Composite Layer at Atmospheric Pressure

Full name of webinars, dates,

Webinar on Nano materials. March 30, 2021

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