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# Design and Synthesis of Nanostructured Catalysts for Sustainable Development

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Nanostructured catalysts are currently employed in diverse applications in key markets, such as catalysis, electronics, biotech, cosmetics. A promising route for synthesis of such powders is provided by Aerosol-based processes that offer important collateral benefits compared to wet chemistry syntheses in terms of flexibility, adaptability and environmental impact. In the past 20 years, Aerosol Based Manufacturing (ABM) has advanced to an efficient one-step synthesis method that enables production of advanced nanostructured materials in an integrated fashion. The method combines aerosol spray generation, thermal treatment with a variety of sources and deposition. The ABM platform enables the generation of controlled size, unique particle morphologies, flexible compositions and integration of multiple functions on the particle level. This work presents the application of this method for the synthesis of oxidation catalysts for use in future engine technologies. The basic catalyst structure is that of Platinum (Pt) nanoclusters dispersed into inorganic porous nanoparticles. The focus of the research is to understand and describe quantitatively the factors that affect the thermal aging process of the catalyst nanoparticles and devise rational methods for improving their performance.

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## Biography

Efstathia Tsarouchi (MEng ChE) is a research engineer at the Aerosol & Particle Technology Laboratory with experience in catalytic reaction engineering, material synthesis & characterization, as well as functionalization of monolithic porous media. She has an engineering background with a MEng in Chemical Engineering from Aristotle University.