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**Heterogeneous nucleation and surface conformal growth of silver nanocoatings on colloidal silica in a continuous flow static T-mixer**

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**Abstract:**

Dielectric-metal core-shell particles with morphologically tunable optical properties are highly promising candidates for applications ranging from theranostics, energy harvesting and storage to pigments and sensors. Most structures of interest have, until now, been produced in small volume wet chemical batch approaches which are difficult to scale. In extension to the growing interest in continuous flow process for the scalable synthesis of single phase nanomaterials, here we describe the formation of two-phase core-shell particles. Specifically, the coating of silver onto colloidal silica particles using a static T-mixer approach is presented. The coating is achieved in a single reaction step in which careful control of educt concentration and process conditions leads to nucleation and surface conformal growth of silver. Through two generations of reactor, good coating yield and process reproducibility are demonstrated. In particular, the ability to control the characteristic time of mixing, as verified by the Villermaux-Dushman reaction, was shown to be crucial in narrowing the range of morphologies obtained in the product particles. Moreover we could tune, through process parameters, the degree of coating of the core particles, leading to

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