Laboratorium für Nano- und Quantenengineering

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Oxidations of Alcohols under Inductively-Heated Flow Conditions with Gold-Doped Superparamagnetic Nanoparticles as Catalyst and Oxygen as Oxidant

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Keywords: flow chemistry; gold, inductive heating, nanostructures, oxidations, superparamagnetism

A continuous flow protocol for the oxidation of alcohols to aldehydes and ketones, respectively, using oxygen gas or atmospheric air is reported (Figure 2). The key features of this work are gold nanoparticles that are attached to the surface of nanostructured core shell particles composed of an Fe_3O_4-containing core and a silica shell. These nanostructured particles exert superparamagnetic properties and thus inductively heat up in an external oscillating electromagnetic field, conditions under which the gold catalyst is able to perform these oxidation reactions (Figure 1).

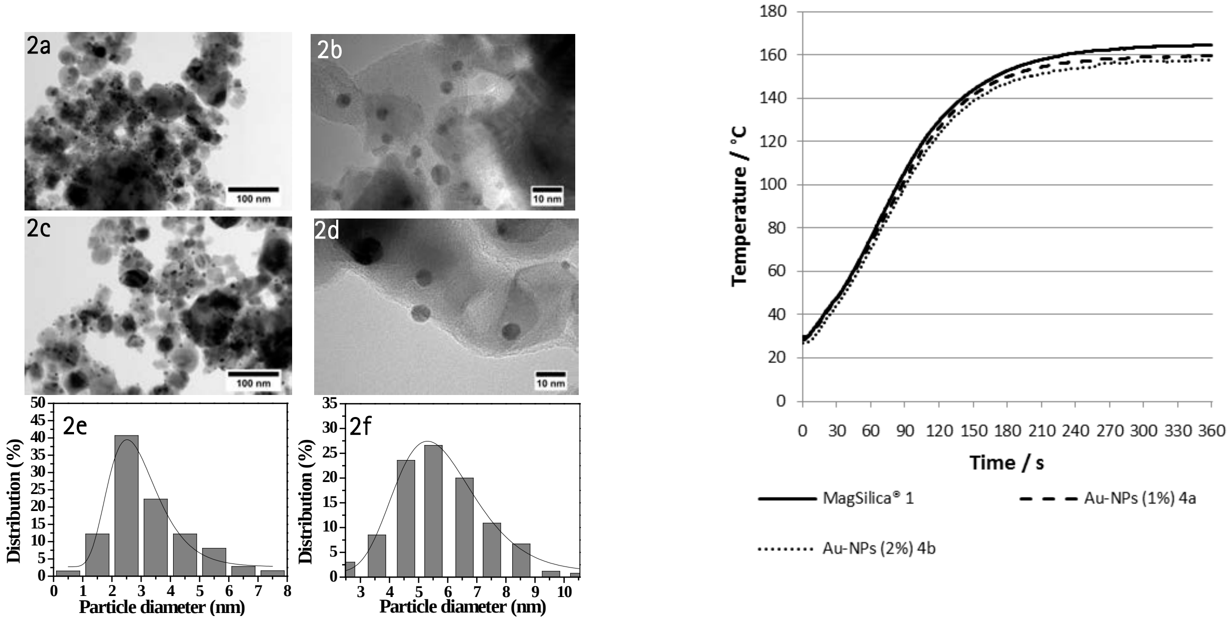

Figure 1. *TEM measurements of catalyst samples and distribution of Au particle size (left) and heating profiles of MAGSILICA® and Au-NPs (1% loading and 2% loading) at 25 kHz (right).*

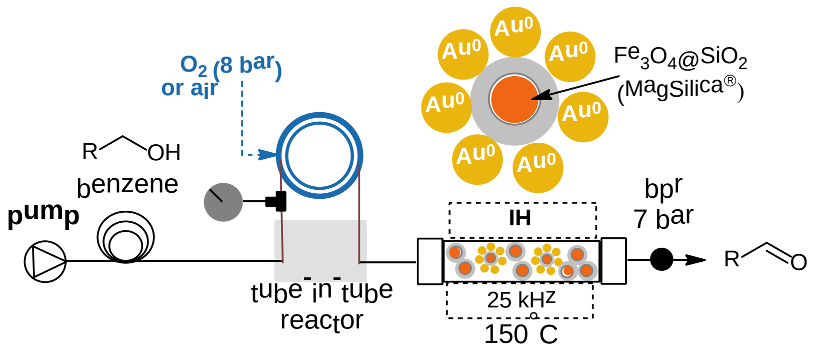

Figure 2. *Overall reaction theme and technical setup.*

Published in: *Adv. Synth. Catal.* **2014**, *356*, 3530–3538.