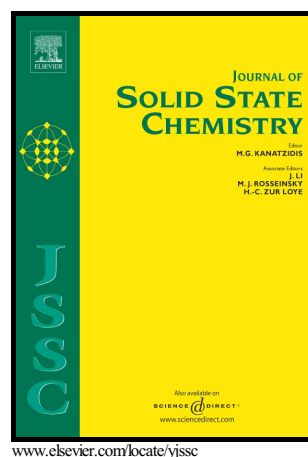


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# Halloysite nanotube-based cobalt mesocatalysts for hydrogen production from sodium borohydride

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## Abstract:

We report the novel hybrid metal-clay mesocatalysts with halloysite nanotubes as a carrier and cobalt as catalytic metal for hydrogen production. The metal deposition on the surface of pristine halloysite and intercalation into nanotubes via ligand-metal complex formation using azines and silane as complexation agents are presented. The catalyst with pre-formed cobalt oxide nanoparticles adsorption on the halloysite tubes' surface showed lower catalytic efficiency. The most active cobalt-containing systems were formed using various azines as Co-ligands. The chelating agent selection strongly affected the hydrogen evolution process and was optimized. The most efficient halloysite based core-shell mesocatalysts contained 16 wt. % of cobalt with maximum hydrogen evolution rate of 3 L/min×g(cat).

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