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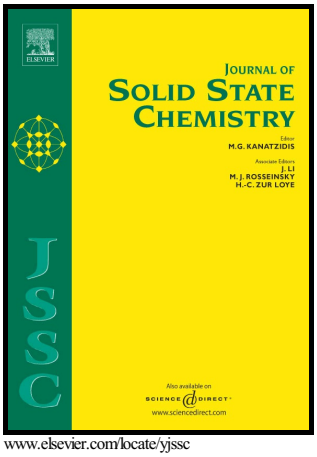


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PII: S0022-4596(18)30372-4
DOI: https://doi.org/10.1016/j.jssc.2018.08.042
Reference: YJSSC20360

To appear in: *Journal of Solid State Chemistry*

Received date: 6 June 2018
Revised date: 12 August 2018
Accepted date: 31 August 2018

Cite this article as: V. Vinokurov, A. Stavitskaya, A. Glotov, A. Ostudin, M. Sosna, P. Gushchin, Y. Darrat and Y. Lvov, Halloysite nanotube-based cobalt mesocatalysts for hydrogen production from sodium borohydride, *Journal of Solid State Chemistry,* https://doi.org/10.1016/j.jssc.2018.08.042

# 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).