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Author: Mattia A. Lucchini Andrea Testino Anastasios Kambolis Christian Proff Christian Ludwig



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**Sintering and coking resistant core-shell microporous silica - nickel nanoparticles for
CO methanation: towards advanced catalysts production**

Mattia A. Lucchini A. , Andrea Testino^(*), Anastasios Kambolis, Christian Proff, Christian
Ludwig

M.A. Lucchini, A. Testino, A. Kambolis, C. Proff, C. Ludwig

Paul Scherrer Institut, General Energy Research Department, CH-5232 Villigen PSI, Switzerland

E-mail: andrea.testino@psi.ch

M.A Lucchini

ETH Zürich, Department of Materials, Multifunctional Material Laboratory, CH-8093 Zürich,
Switzerland

A. Kambolis,

École Polytechnique Fédérale de Lausanne (EPFL), Institut des Sciences et Ingénierie Chimiques,
CH-1015 Lausanne, Switzerland

C. Ludwig

École Polytechnique Fédérale de Lausanne (EPFL), Civil and Environmental Engineering, CH-1015
Lausanne, Switzerland

Graphical abstract

Highlights:

- $Ni@SiO_2$ core-shell particles with improved stability and activity were produced;
- The material shows anti-sintering and anti-coking properties;
- The microporous shell is permeable to reactants and products gases;
- The material is produced according a scalable process;
- The concept can be applied to several materials to improve stability and activity.

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