

## 3D printed Ni functionalized polymer derived ceramics as CO<sub>2</sub> methanation catalysts

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A typical methanation catalyst consists of an active phase finely dispersed on a support. Various noble and non-noble metals have been investigated, with Ni being the most promising due to its low cost, abundance, and high activity [1]. In addition, the catalyst support is crucial in improving the performance of a heterogeneous catalyst, affecting metal-support interaction and metal dispersion. Metal oxides, composite oxides, and SiC are the most studied catalyst supports, with Al<sub>2</sub>O<sub>3</sub> being the most commonly used one [2]. This thesis utilises the relatively new concept of polymer derived ceramics (PDCs) as support and combines their functionalisation with 3D printing to create complex shapes [3]. Thus, the focus of this work is the improvement of the catalytic activity of the printed components in combination with the characterisation of the material.

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