

3D Deposition Technology

Apparatus and process for depositing catalytic nanoparticles in 3D on powder supports



Positive Impact

Unique catalyst synthesis method, high quality catalysts, versatile composition of catalysts, quickly scalable



Initial Validation

An apparatus and a process for depositing catalytic nanoparticles in 3D on powder supports is available (see photo on the right). Comprehensive validations have been conducted in lab settings.



Solution

A gas stream enriched with nanoparticles moves at low velocity in counter current to the powder catalyst support, which is circulated within the apparatus (see drawing on the right). The nanoparticles are adsorbed by van der Waals forces. .

The described technical approach has been proven to be viable in laboratory experiments (e.g. electron microscopy).

Funding is granted for a period of two years to further develop and optimize the deposition process.



Problem

To establish sustainable and competitive chemical processes, efficient catalysts are crucial. Amongst others, catalysts are used in powder form. Thereby, their synthesis constitutes a decisive first step.

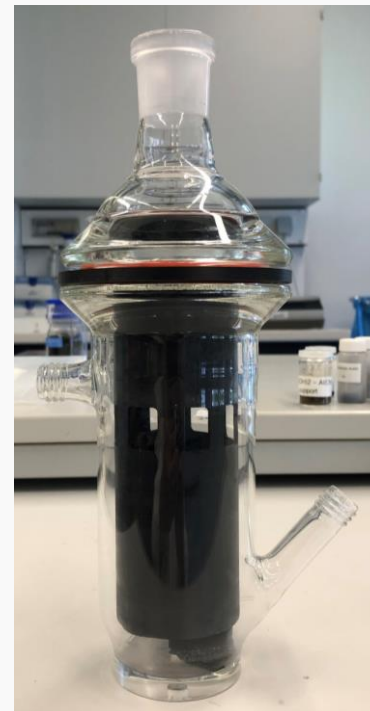
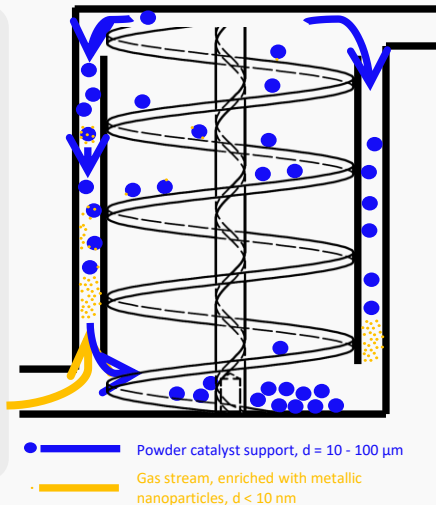
Obstacles of conventional wet-chemical synthesis routes for powder catalysts:

- Enrichment / depletion of nanoparticles on the powder support
→ No homogeneous distribution
- Oxidic phases not fully reduced
- No defined particle size distribution
- Limited combination of materials
- Time consuming with many different steps
- Not scalable



Technology

- An apparatus and process for the deposition of catalytically active nanoparticles on powder supports.
- Tool to synthesize various catalytic materials.
- German patent application: 102024105425.5 (2024)



Call to Action !!!

We are looking for passionate individuals with entrepreneurial and business development skills. If you have a background in chemical engineering and have an eye for innovation, contact us!

If you are interested, please reach out to entrepreneur@hightechxl.com



Potential Markets

There are several potential markets where this problem is an issue.

- System integrators (particle generation + 3D deposition)
- Public research labs
- Industrial research labs
- Catalyst manufacturers

