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Project: Master Thesis/Internship
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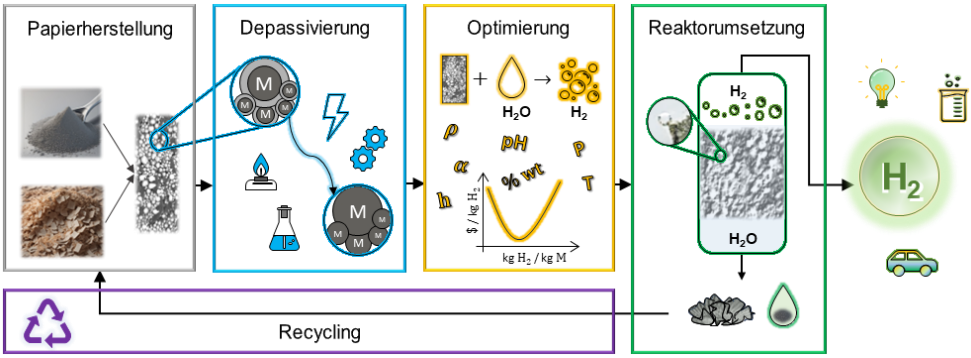
Development of a New Reactor Concept for Hydrogen Production using immobilized metal powders

Our current focus is on advancing hydrogen generation technologies through novel reactor designs that utilize reactive metal powders such as aluminum and magnesium. These metals, known for their exothermic reactions with water, offer a promising avenue for efficient hydrogen production. In collaboration with our research partner, the project's goal is to develop a new reactor concept that maximizes the hydrogen production rate from metal powders immobilized on special technical paper while overcoming the challenges posed by their surface passivation and the difficulties in handling of fine powders.



This involves starting from laboratory-scale experiments to design, optimize and scale up a reactor that can efficiently produce hydrogen in a safe, autonomous and decentralized manner, suitable for applications in various sectors, including mobility and energy storage.

Tasks and Objectives

- To experimentally investigate the hydrogen production efficiency of various metal powders, focusing on the effects of particle size, metal type and reaction conditions.
- To design and test a lab-scale reactor prototype that addresses the challenges of surface passivation and optimizes hydrogen generation rates.
- To systematically vary reactor parameters, such as temperature, pressure and metal surface treatment methods, to enhance the efficiency and scalability.
- To model the reactor performance to predict scalability and industrial applicability.

Requirements

- A solid understanding of reactor design, chemical kinetics and process engineering principles.
- Strong analytical and problem-solving skills.
- Passionate about sustainable energy technologies and innovation.

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