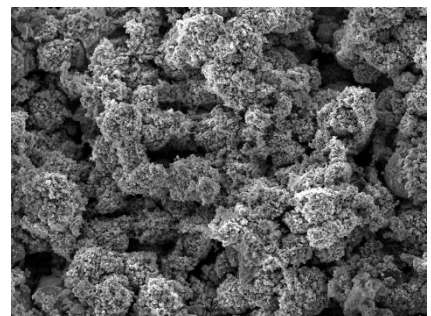


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|-----------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Bachelor's thesis | <input type="checkbox"/> theoretical |
| <input type="checkbox"/> Design exercise | <input checked="" type="checkbox"/> experimental |
| <input checked="" type="checkbox"/> Master's thesis | <input type="checkbox"/> design engineering |

Master's thesis:

Characterization of material synthesis for oxygen uncoupling from metal-oxides

The working group fuel cells and hydrogen in cooperation with BEST (Bioenergy and Sustainable Technologies) investigates a **novel chemical looping technology** to supply pure oxygen for biomass gasification (chemical looping oxygen uncoupling, CLOU). The process is a promising approach to sequestrate pure CO₂ from renewable feedstocks (bioenergy carbon capture and storage technology, BECCS), which enables **overall negative carbon dioxide emissions** and hence **directly mitigates the global warming**. As the working group was recently involved in similar chemical looping processes, own research found unique demands of such processes towards the applied oxygen carriers.



The **aim of the master's thesis** is to transfer previous findings from chemical looping processes towards this CLOU process. Several state-of-the-art synthesis methods based on own experience and latest scientific literature are reviewed and characterized to find the most promising approach to advance future research. The materials are synthesized in-house and characterized concerning their longevity and kinetic properties via thermogravimetry (TGA), morphology (SEM/EDX, XRD, MIP, BET) and mechanical resistance. The most promising methods will be upscaled and the materials will be tested in lab benches by our project partners. Within your master's thesis you will be involved in a **diversified and motivated team of researchers** and work in strong collaboration with your colleagues. The desired outcomes significantly advance the knowledge of the research group as well as the worldwide scientific community in a highly regarded subject.

Contact: **DI Michael Lammer**
Dr. Sebastian Bock
 Inffeldgasse 25C, MCEG 198
 +43 (316) 873 – 8795
michael.lammer@tugraz.at
Information: <https://www.greentech.at/neue-technologie-fuer-reine-luft-mit-biomasse/>

Starting date: immediately