Research Topic: Microwave-Assisted Synthesis of $BaInO_{2.5}$-Based Oxides for Oxygen Transport Membranes

Project Description:

$BaInO_{2.5}$ is an interesting material for oxygen transport membranes (OTM) due to its mixed ionic-electronic conductivity, brownmillerite structure, and possibility of *B*-site doping or substitution, which makes it suitable for efficient oxygen transport. This project focuses on leveraging microwave-assisted synthesis methods to fabricate $BaInO_{2.5}$-based oxides. Microwave irradiation offers unique advantages, including rapid heating, enhanced reaction kinetics, and precise control over material properties. By harnessing these benefits, we aim to develop efficient routes for producing high-performance OTM materials.

Research Goals:

- Develop microwave-assisted synthesis protocols for the synthesis of $BaInO_{2.5}$-based oxides.
- Optimize the synthesis process to achieve high-purity $BaInO_{2.5}$ materials.
- Characterize the structural, morphological, and oxygen transport properties of the synthesized membrane materials.

Qualifications:

Background in materials science, chemistry, physics, or related fields.

Experience with synthesis and characterization techniques.

Strong analytical and problem-solving skills.

Enthusiasm for interdisciplinary research and collaboration.

This topic is suited for ARL or Master thesis

How to Apply:

Interested candidates should submit a resume/CV and a brief cover letter outlining their interest in the position and relevant experience to xingxing.xiao@mr.tu-darmstadt.de before **8 May 2024**.