HYDRA – FAIR Open Infrastructure for Modelling Hydrogen Storage & Rare-Earth Magnetic Materials

OSCARS
Open Science Clusters' Action for Research & Society

HYDRA aims to advance sustainable energy technologies by creating an open, FAIR-compliant database enabling the rapid and resource-efficient modeling of new rare earth elements – REE-containing materials that meet the requirements of future hydrogen technologies and green energy. These materials are essential for hydrogen storage and green energy systems, such as wind turbines and electric motors.

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Challenge

Scarcity and high cost of REEs - playing a vital role in both hydrogen storage and the production of high-performance permanent magnets - and the absence of systematised data linking synthesis and processing parameters to structural properties impede the effective prediction of functional properties.of products based on them.

Solution

HYDRA aims to create a structured database containing the results of experimental studies on the properties of REE-containing materials, which depend on the conditions of their synthesis, processing, crystallographic parameters, microstructural features, phase, and chemical composition.

Scientific Impact

Implementing the project involves filling open digital platforms for the broad scientific community, contributing to energy independence and sustainable development. The result will be an intelligent decision support system for researchers and developers in the hydrogen and green energy field.

Partners

Lviv Polytechnic National University - LPNU

https://oscars-project.eu/projects/hydra-fair-open-infrastructure-modelling-hydrogen-storage-rare-earth-magnetic-materials