VIETNAM ACADEMY OF SCIENCE AND TECHNOLOGY

INSTITUTE OF MATERIALS SCIENCE

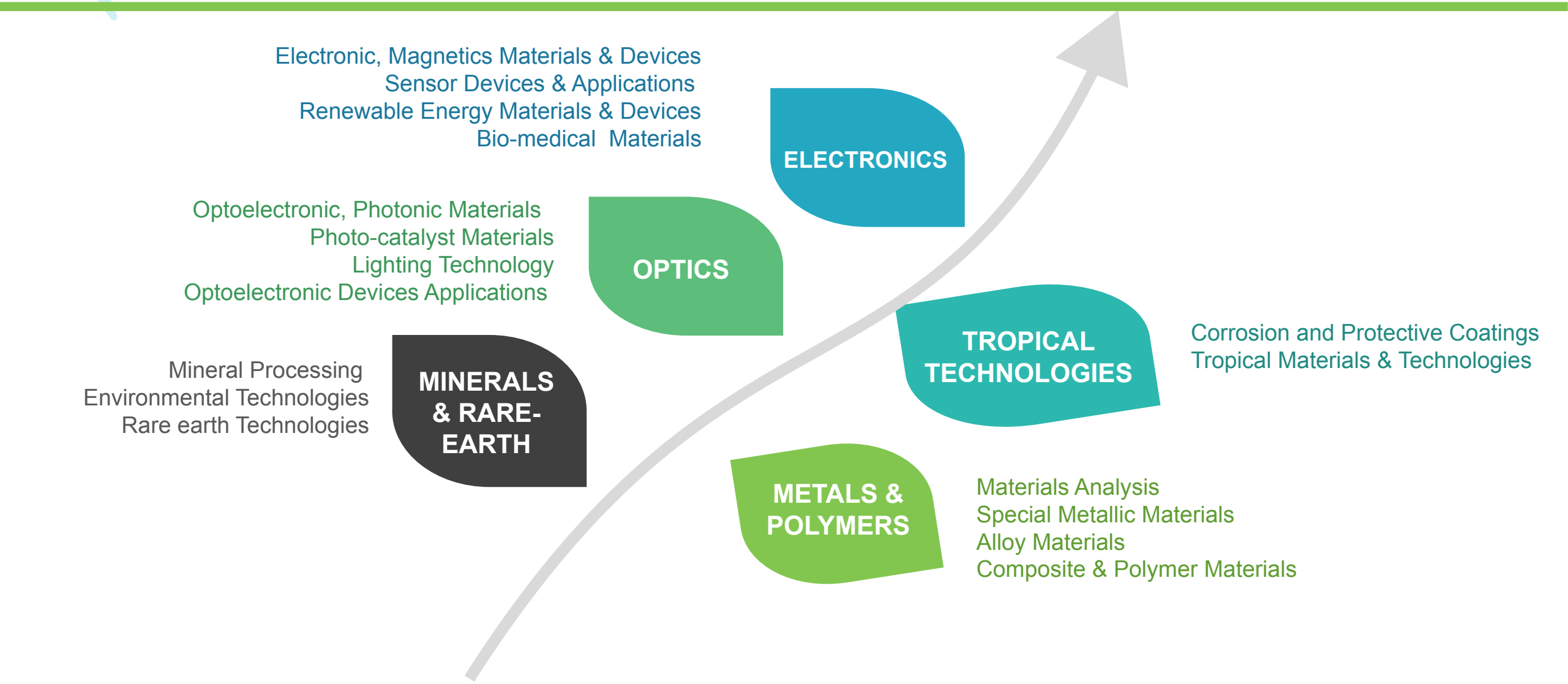
RESEARCH AND DEVELOPMENT OF HYDROGEN TECHNOLOGY at INSTITUTE OF MATERIALS SCIENCE (IMS)





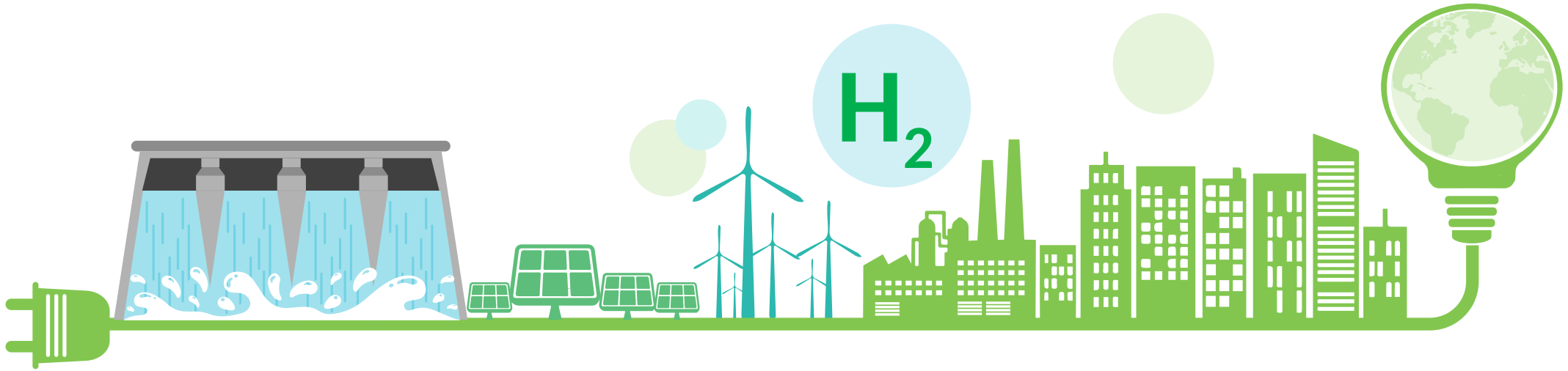
Hanoi, 11/2026

RESEARCH STRUCTURE AT INSTITUTE OF MATERIALS SCIENCE



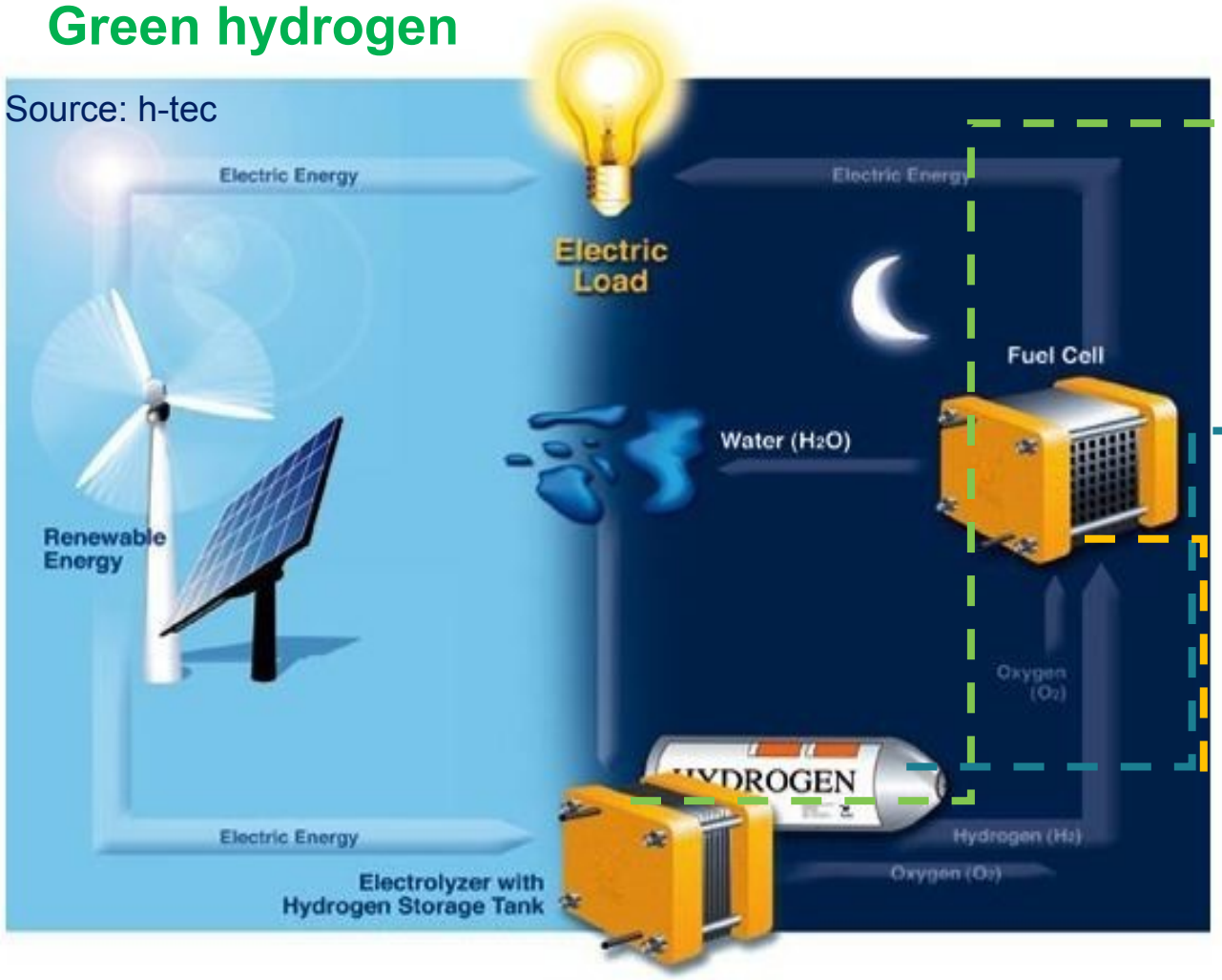
INSTITUTE OF MATERIALS SCIENCE

LEADING R&D ORGANIZATION IN HYDROGEN MATERIALS AND DEVICE DEVELOPMENT IN VIETNAM



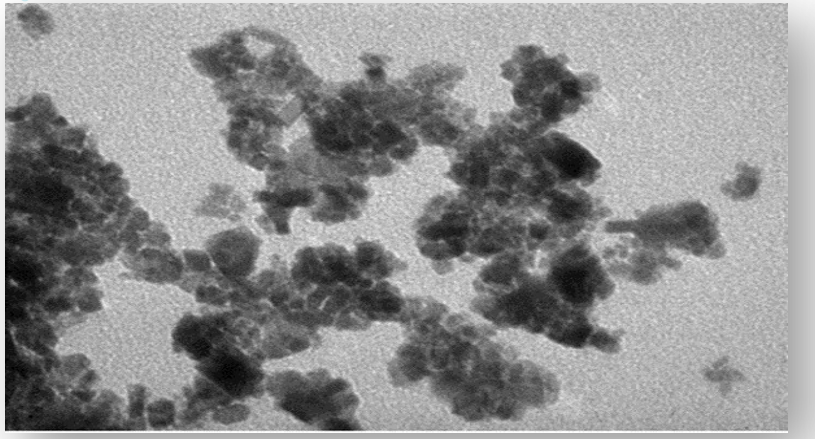
FUNDAMENTAL RESEARCH

Green hydrogen

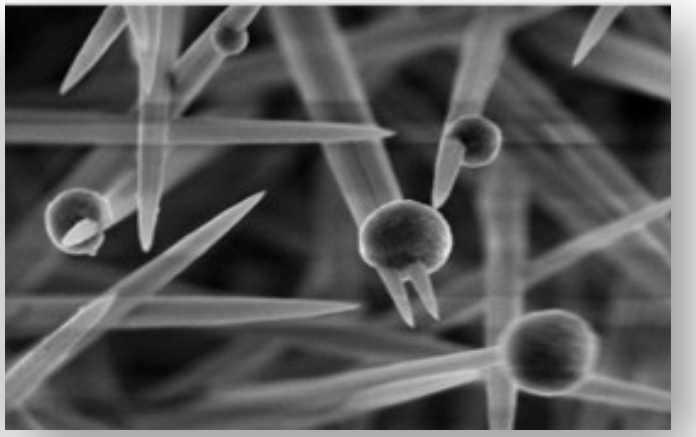


- Proton exchange membrane water electrolyser (PEMWE)
- Solid-state hydrogen storage (materials: borohydrides, $NaBH_4$, Mg alloys,…)
- Proton exchange membrane fuel cell (PEMFC)

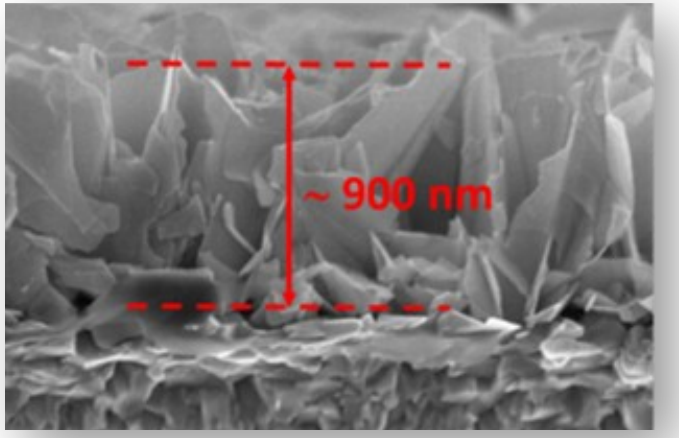
FUNDAMENTAL RESEARCH



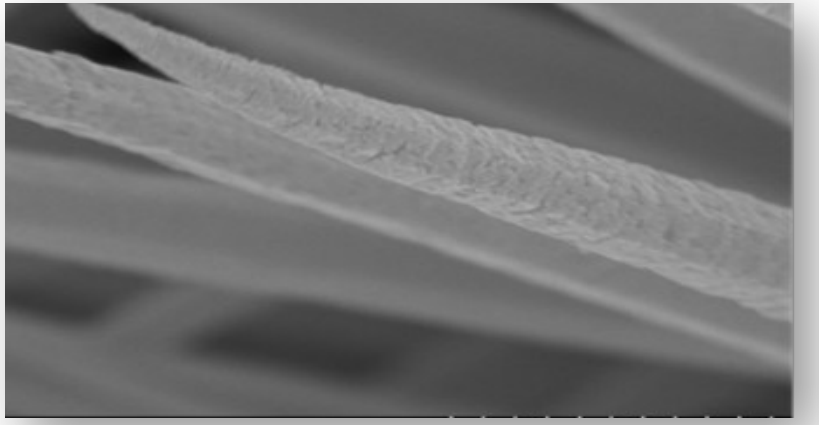
$Ir_{0.7}Ru_{0.3}O_2$ nanoparticles



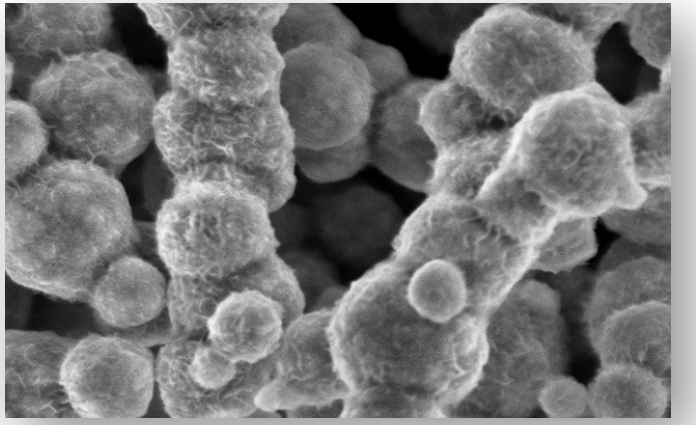
$CoMn[M(CN)_6]$ nanofibers



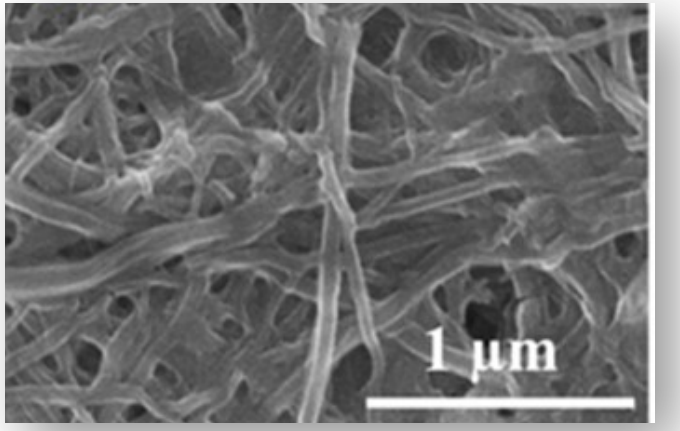
$AgInGaS(Se)_2$ nano thinfilms



$Mn_xCo_{3-x}O_4$ nanorods



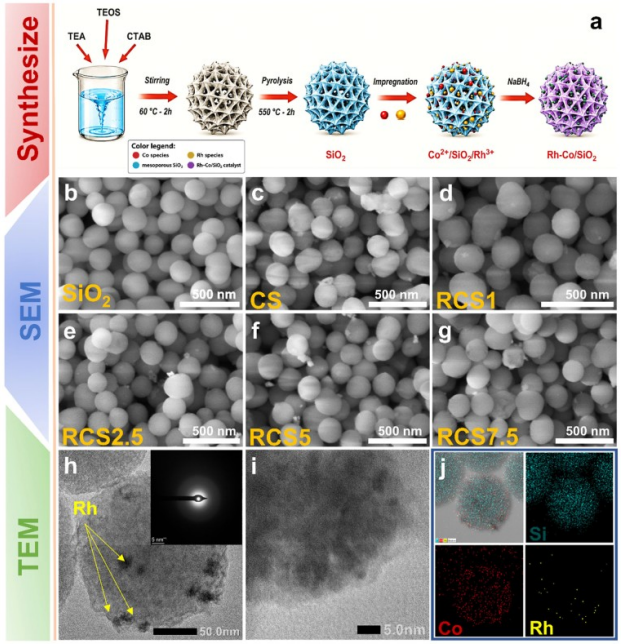
Co, Ni nano particles

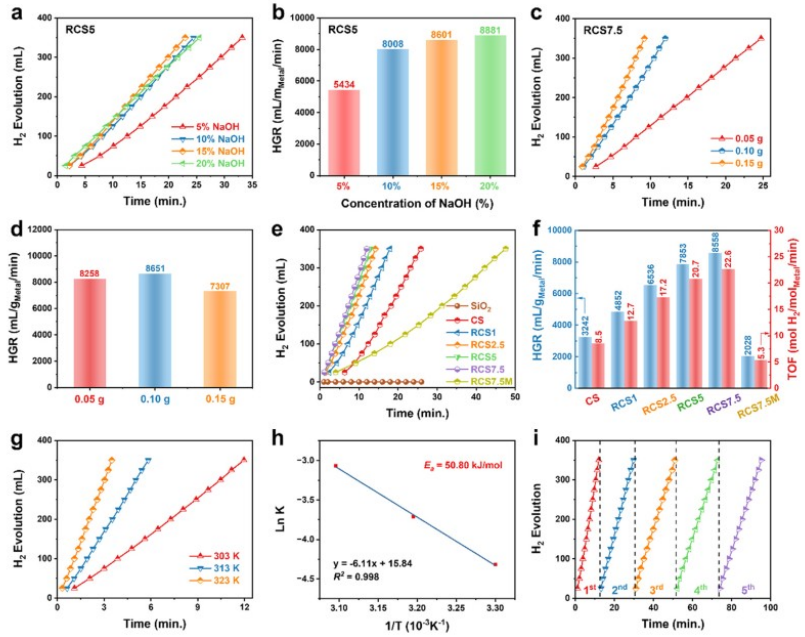


hybrid membrane porphyrin@g-C_3N_4@Ag

FUNDAMENTAL RESEARCH

Rh-promoted Co catalysts on mesoporous SiO_2 for hydrogen generation from $NaBH_4$ hydrolysis





> 30 SCIE papers have been published

J. Material Science and Technology, IF: 16.8

RSC Advances, IF: 6.1

J. Energy Storage, IF: 10.7

Process Safety and Environmental Protection, IF: 7.9

…

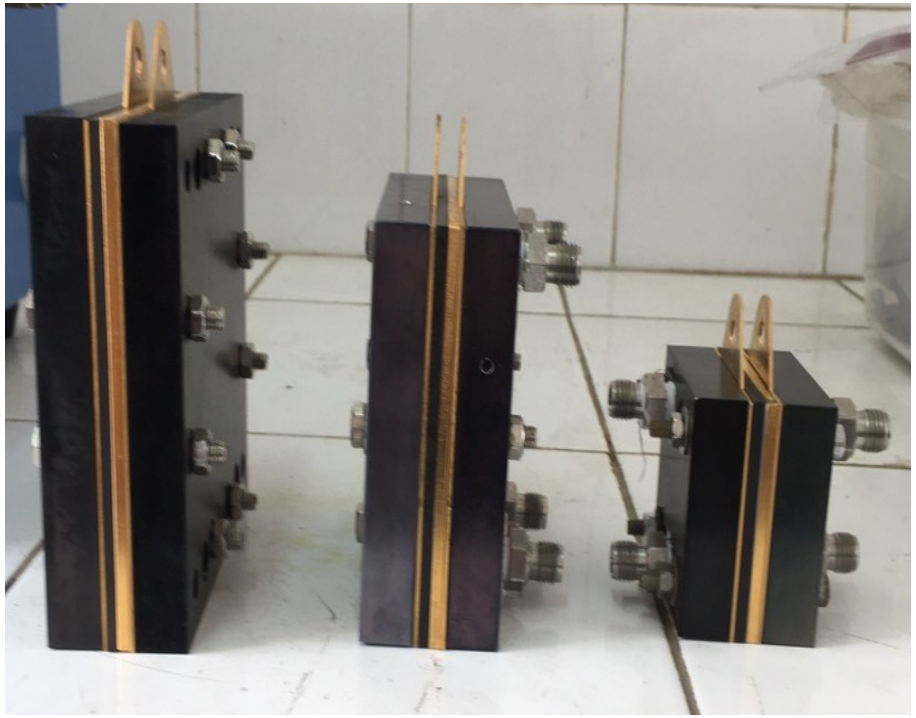
> 20 reports at national and international conferences

> Colaboration: >10 national and international research Ins. and Uni.

PROTOTYPES FOR TESTING

PROTON EXCHANGE MEMBRANE WATER ELECTROLYZER

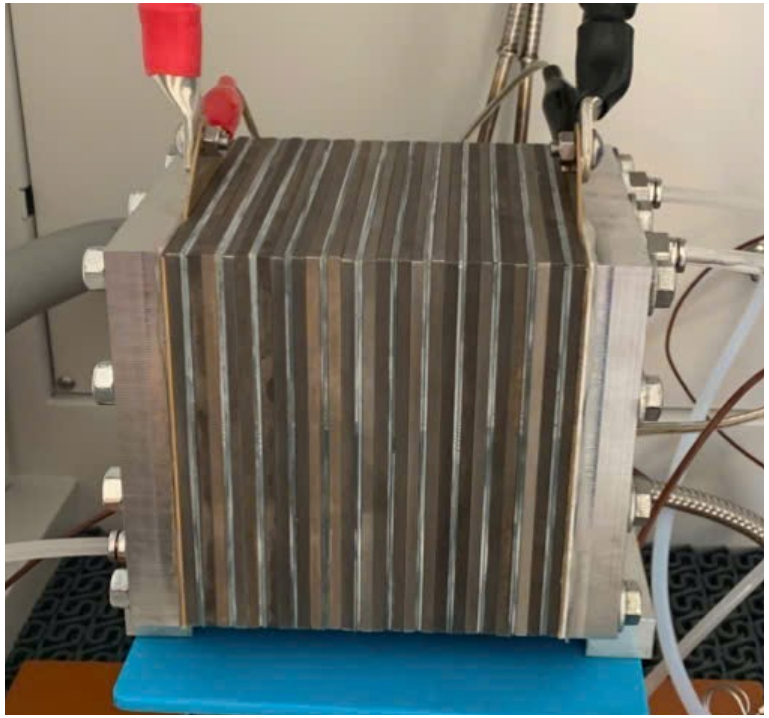
PEMWE stack



PEMWE cells (active area < 100 cm^2)



PEMWE stack (100 L H_2/h)



PEMWE stack (250 L H_2/h)

PROTOTYPES FOR TESTING

MATERIAL- BASED HYDROGEN STORAGE

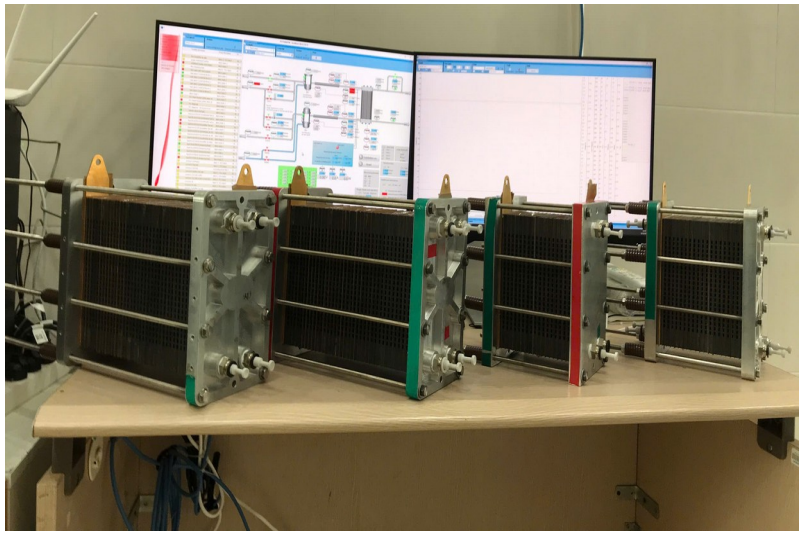
Hydrogen absorption–release systems using Mg-based materials: (a) single-tank system and (b) integrated four-tank system.



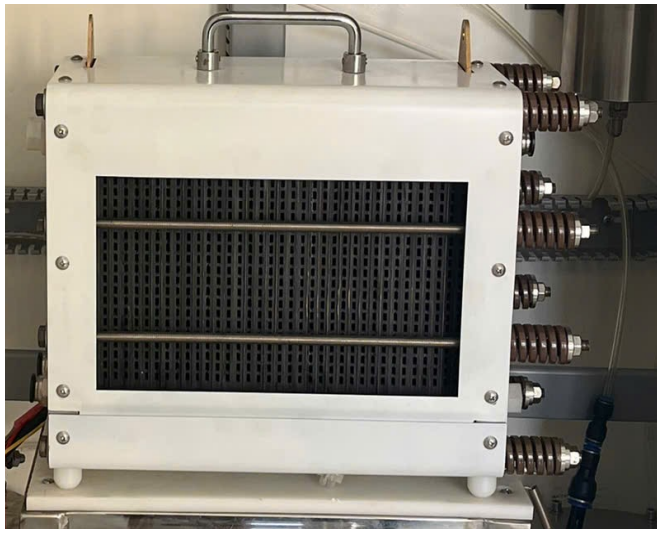


PROTON EXCHANGE MEMBRANE FUEL CELL

PEMFC Stack 1kW (40 cells)

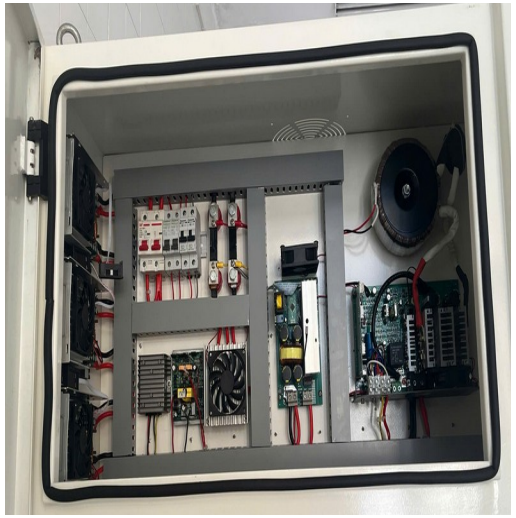


500 W (20 cells)



PROTOTYPES FOR TESTING

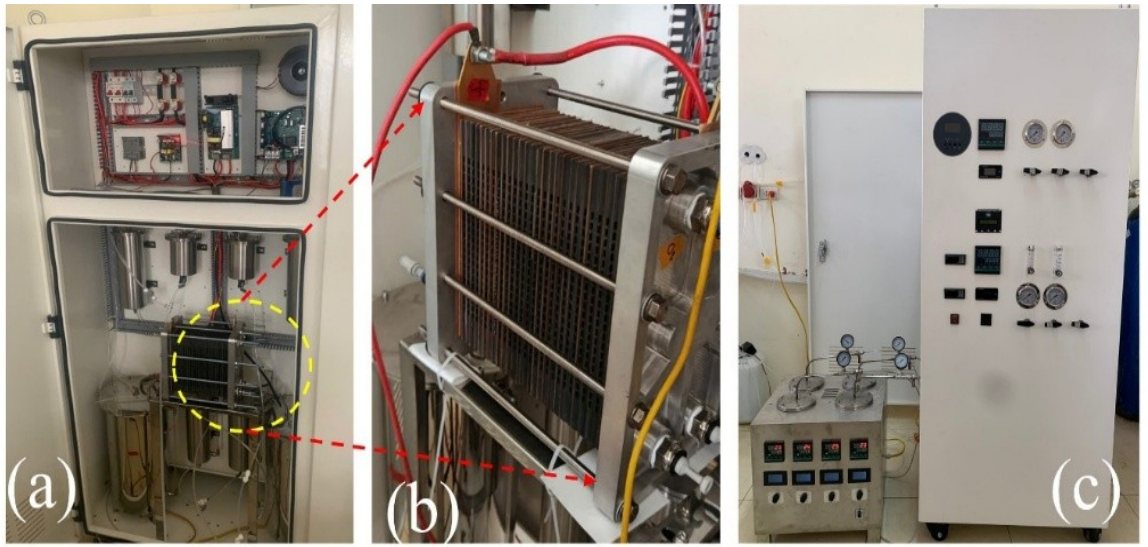




AC/DC converter → Controller

PEMWE 250L H2/h





Hydrogen absorption–release:four tank system applied to test 500W fuel cell

TESTING EQUIPMENTS



PEM water electrolyzer testing station 3KW

(Scitech Korea)



High accuracy gravimetric sorption analyzers, XEMIS-001 Hiden Isochema, UK



Fuel cell testing station 100W and 5kW

(Horiba –Germany)



Thank you for your attention