



KEMIJSKI INŠTITUT

Vabilo na Preglov kolokvij / Invitation to the Pregl colloquium

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Četrtek / Thursday 19. 5. 2022, ob / at 13:00

Velika predavalnica Kemijskega inštituta /

Great Lecture Hall

National Institute of Chemistry

Hajdrihova 19, Ljubljana, Slovenia

Catalyst Development Needs for Sustainable Proton Exchange Membrane (PEM) Fuel Cells & Electrolyzers for the Hydrogen Economy

Driven by climate change, the global community is seeking to expand renewable energy generation and to decarbonize the transportation sector, which has a significant share in the world-wide CO₂ emissions. This can partially be addressed by the development and deployment of light-duty battery electric vehicles (BEVs). On the other hand, hydrogen is envisioned as fuel for mid- and heavy-duty applications (SUVs, trucks) using fuel cell electric vehicles (FCEVs) based on proton exchange membrane (PEM) fuel cells.

In the latter case, hydrogen must be produced from renewable electricity (wind, solar), which can also be used for decarbonizing chemical processes like steel and ammonia production as well as for temporary large-scale energy storage. PEM based water electrolyzers are promising candidates for the generation of high-pressure hydrogen. However, both PEM fuel cell and water electrolyzer technologies currently require significant amounts of costly and supply-limited precious metals, which could restrict their large-scale implementation, so that improved catalyst and electrode concepts must be devised. These challenges will be discussed.

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Vljudno vabljeni / Kindly invited