

Insight into electrolysis cells from Haldor Topsøe

Haldor Topsøe is a world leader in the development and manufacture of catalysts and the design of process plants for the chemical and petrochemical industries.

Haldor Topsøe is currently developing solid oxide electrolysis cells (SOECs) for the production of hydrogen (H_2) and synthesis gas. Part of its research focuses on the contact points between the layers of a commercial electrolysis stack.

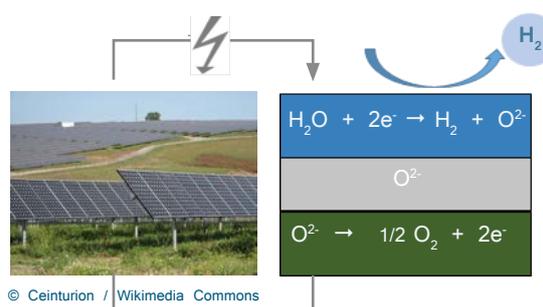
This is because physical stress over prolonged periods of operation may weaken the connection between individual layers of the stack, resulting in a loss of performance. The interior of the stack needs to be inspected in a non-destructive manner.

Neutron imaging is the most appropriate technique when it comes to penetrating centimeters of metal whilst maintaining sensitivity to hydrogenated materials (such as polymers, for example).

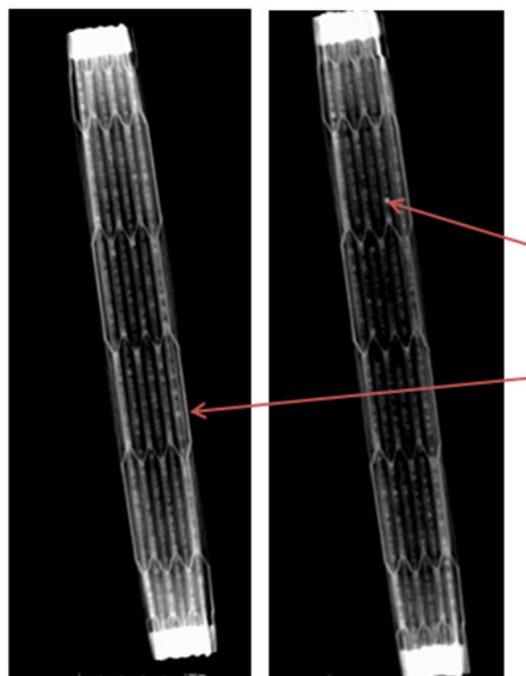
Haldor Topsøe therefore chose to perform neutron radiography and tomography investigations at the Maier-Leibnitz Zentrum in Germany. Their researchers were able to identify hitherto unknown features within the stack.

"All the way through we received good and competent feedback from the parties. [...] The experiments revealed interesting features we had not considered before seeing the data obtained."

Christoffer Tyrsted, Research Scientist, Topsøe



Electricity from renewable sources (such as solar energy) is used by SOECs to produce hydrogen (H_2). The hydrogen can then be stored for later use as a fuel.



The experiment revealed interesting features that HALDOR-TOPSØE had not considered before seeing the results of neutron imaging. The arrows indicate the inhomogeneities identified within the stack.

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