

EVALUATION OF METALLIC COATINGS AS HYDROGEN PERMEATION BARRIERS

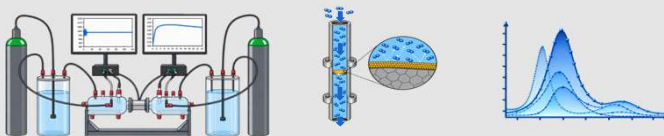
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Introduction

The use of hydrogen permeation barriers such as nickel and zinc might be an industrially compatible solution to repurpose gas infrastructure for hydrogen. Addressing this is a key focus of both the MITHRIL project and the research activities of the SMS group..

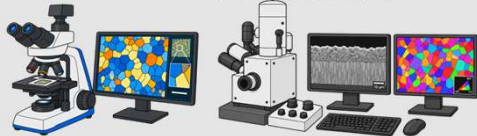
Techniques used for coating testing

Electrochemical and gaseous permeation



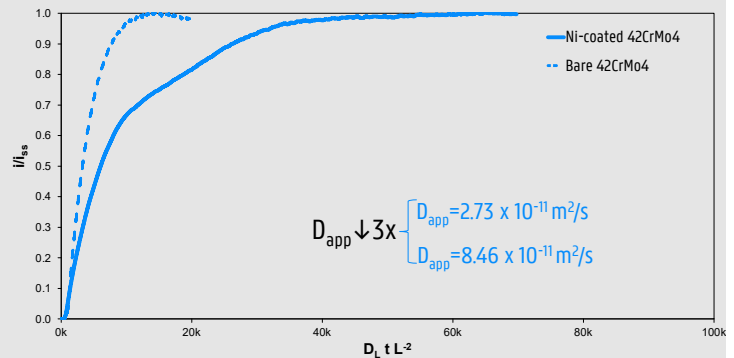
TDS

Microstructural characterization



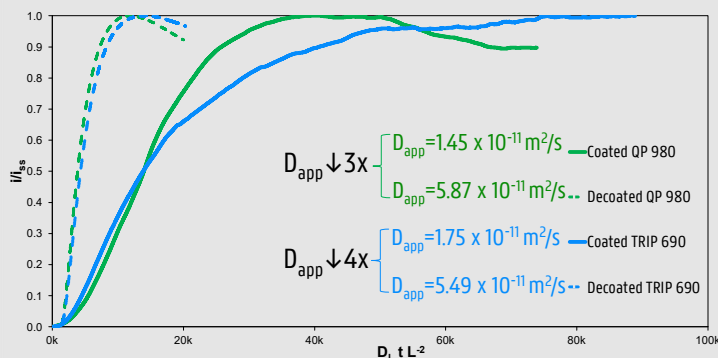
Preliminary results: nickel coatings

Normalized hydrogen current vs. normalized time

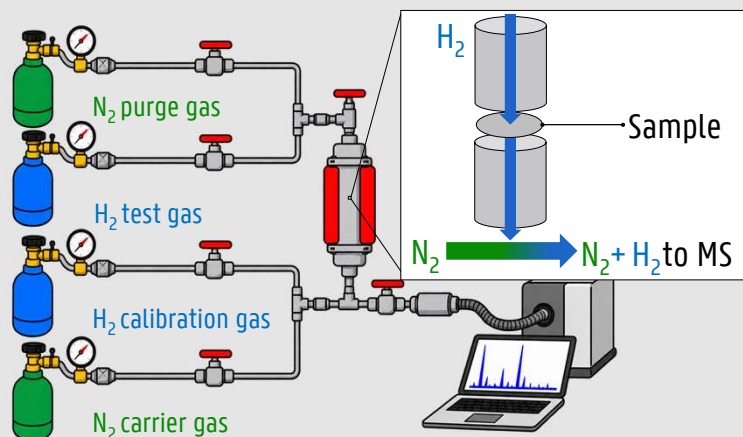


Preliminary results: Industrial zinc coatings

Normalized hydrogen current vs. normalized time



Upcoming: Fully gaseous permeation setup

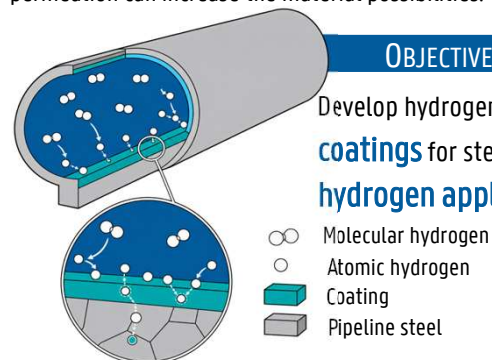


CONTEXT

Pipeline materials for hydrogen transmission through Europe are currently being decided, the use of coatings that prevent or delay permeation can increase the material possibilities.

OBJECTIVE

Develop hydrogen **barrier coatings** for steels in **hydrogen applications**



COATING TECHNIQUES

