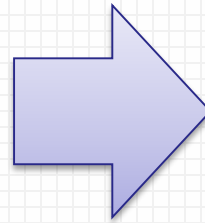
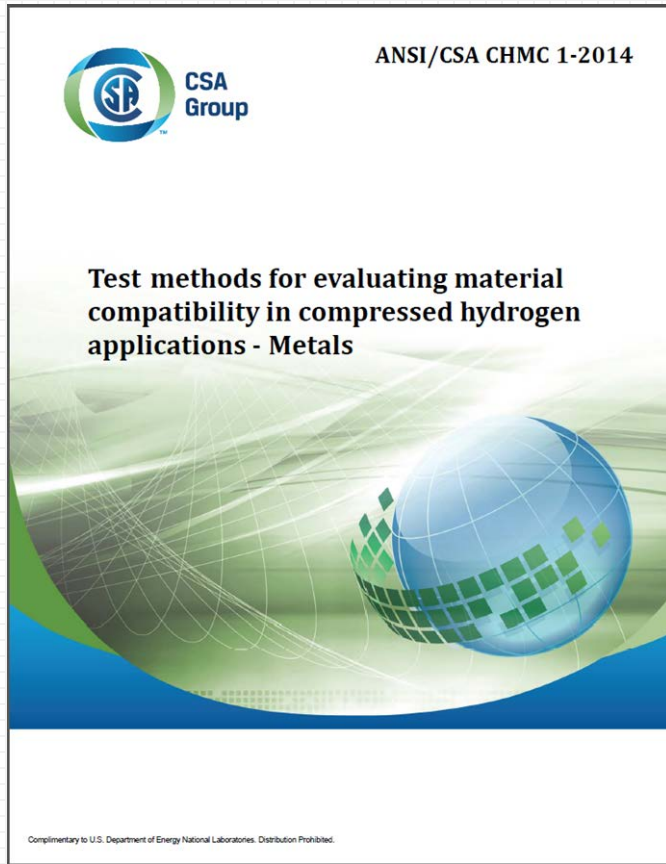


Current Status for Hydrogen Material Compatibility Tests of Polymers in Korea

Nak-Kwan Chung

GTR13-2 6th Meeting on 18~20 June 2019 @ CATARC, Tianjin, China

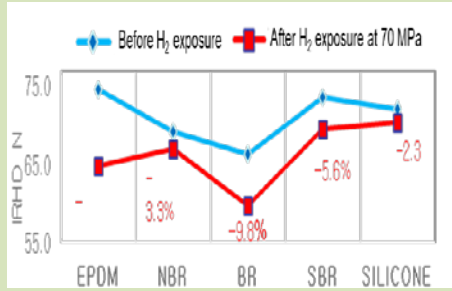
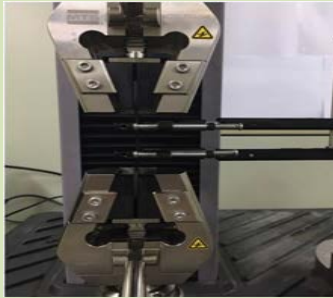


CHMC 2

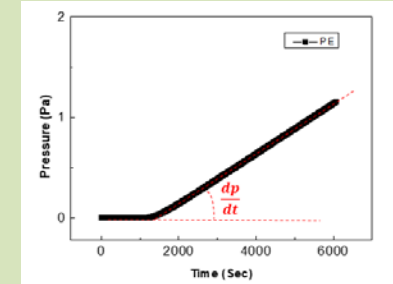
– Test Methods for Evaluating Material Compatibility in Compressed Hydrogen Applications – Polymers

1. Polymer Permeation
2. Physical Stability
3. Rapid Cycling Effects
4. Dynamic Frictional Wear
5. Property Changes
6. Material Contamination

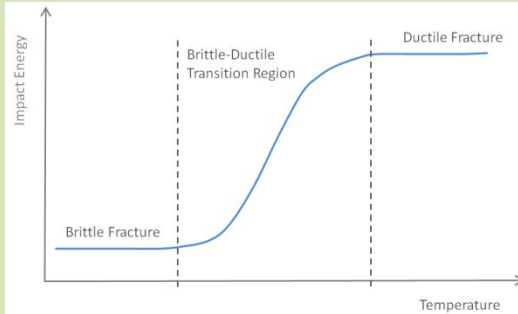
❖ Tensile Test



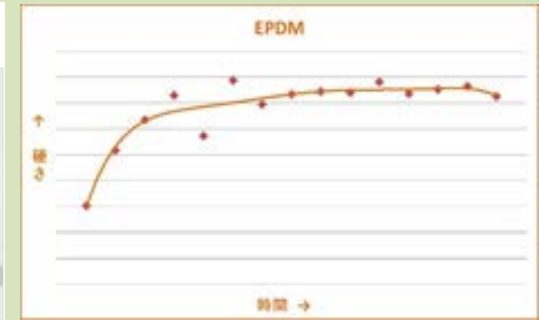
❖ Hydrogen Permeability ($P_{H_2} < 0.5 \text{ MPa}$)



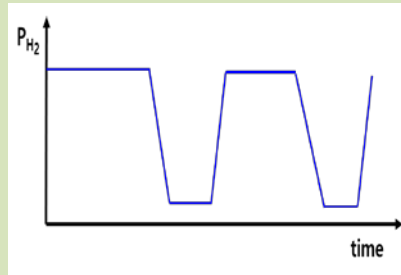
❖ Impact Test



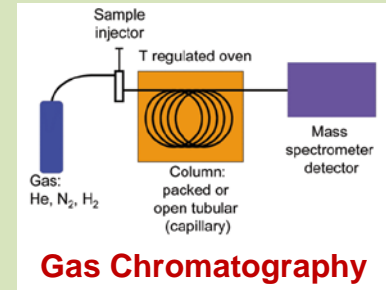
❖ Hardness Test



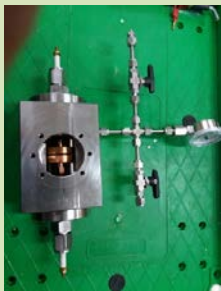
❖ Hydrogen Cycling Test



❖ Material Contamination Measurement

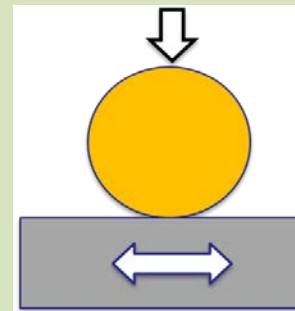


❖ Permeability under P_{H_2} up to 70 MPa



Permeability measurement of O-ring in high-pressure H_2 environment

❖ Dynamic Friction Wear



Tribology test in high-pressure H_2 environment