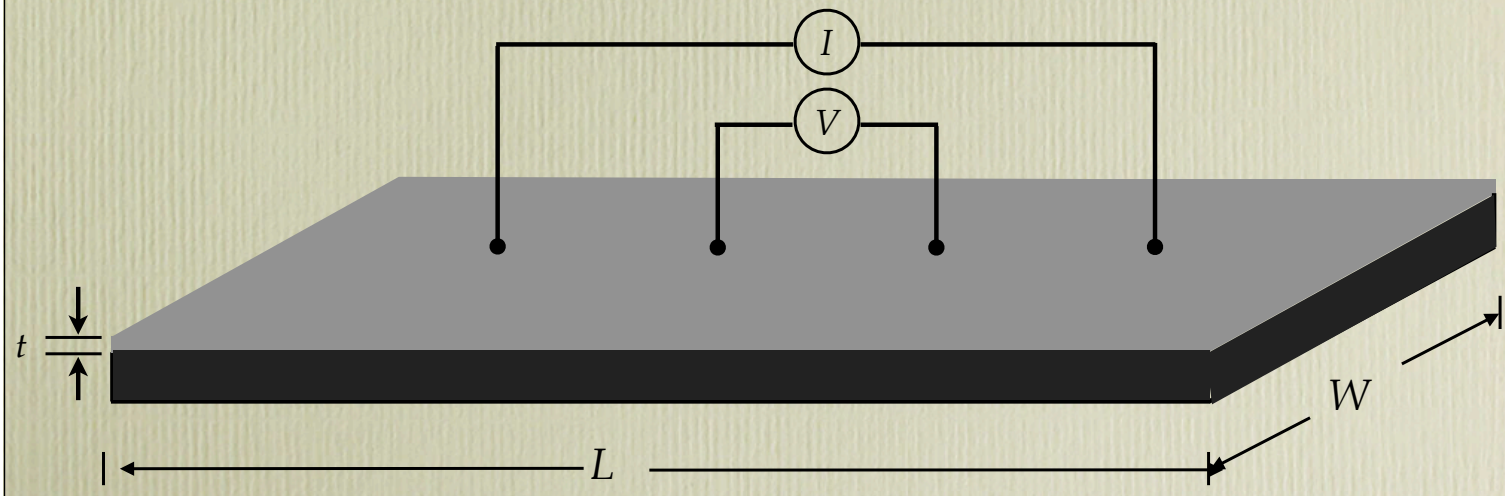
Resistance

- Changes in all material properties affect resistance
  - Composition
  - Temperature
  - Hydrogen uptake
  - Strain
  - Exposure to light
  - Oxidation
- Often used as a monitoring method

Resistance measurements



Resistance measurements

- Changes in all material properties affect resistance
  - Composition
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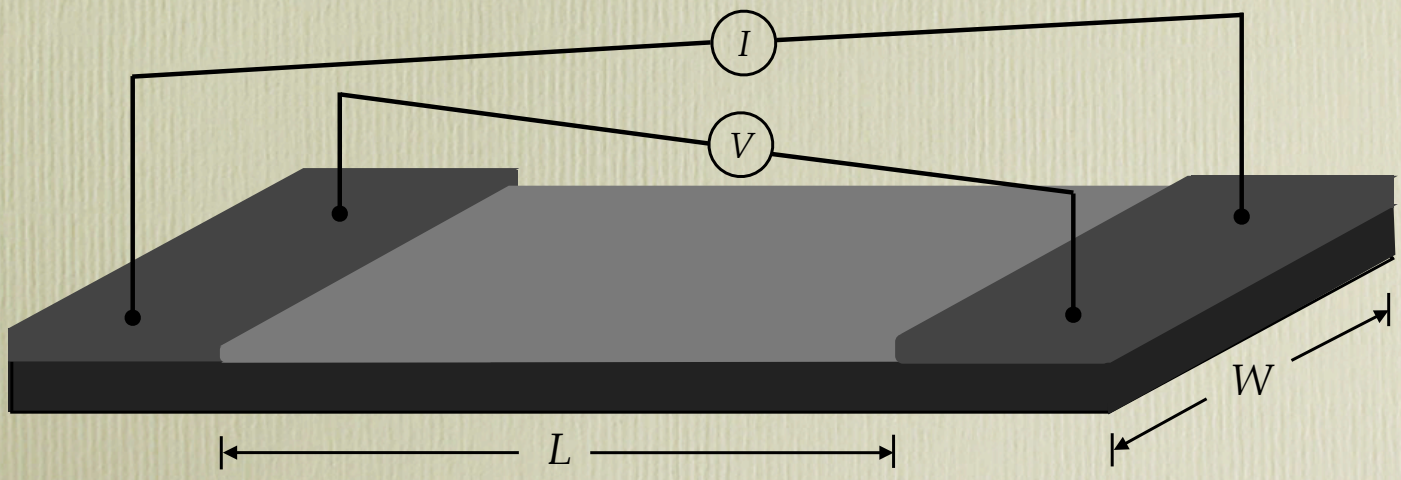
Resistance measurements

- Changes in all material properties affect resistance
  - Composition
  - Temperature
  - Hydrogen uptake
  - Strain
  - Exposure to light
  - Oxidation
  - thickness

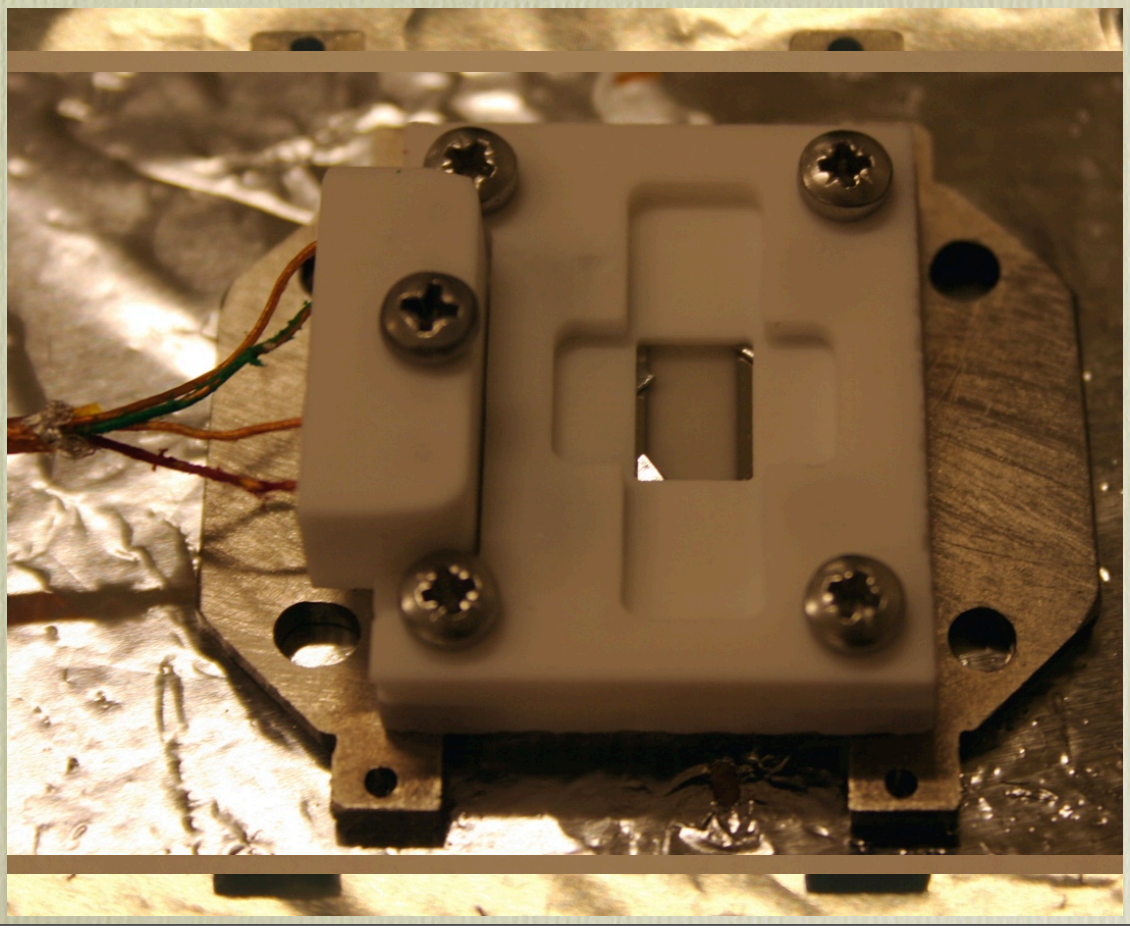
Resistance measurements

- Changes in resistance with thickness
  - Surface scattering
  - Grain boundary scattering
- At what nominal thickness does the film start to conduct?
- At what nominal thickness does the film become continuous?
- Can we use the resistance measurements to obtain information during growth and after

Resistance measurements in situ

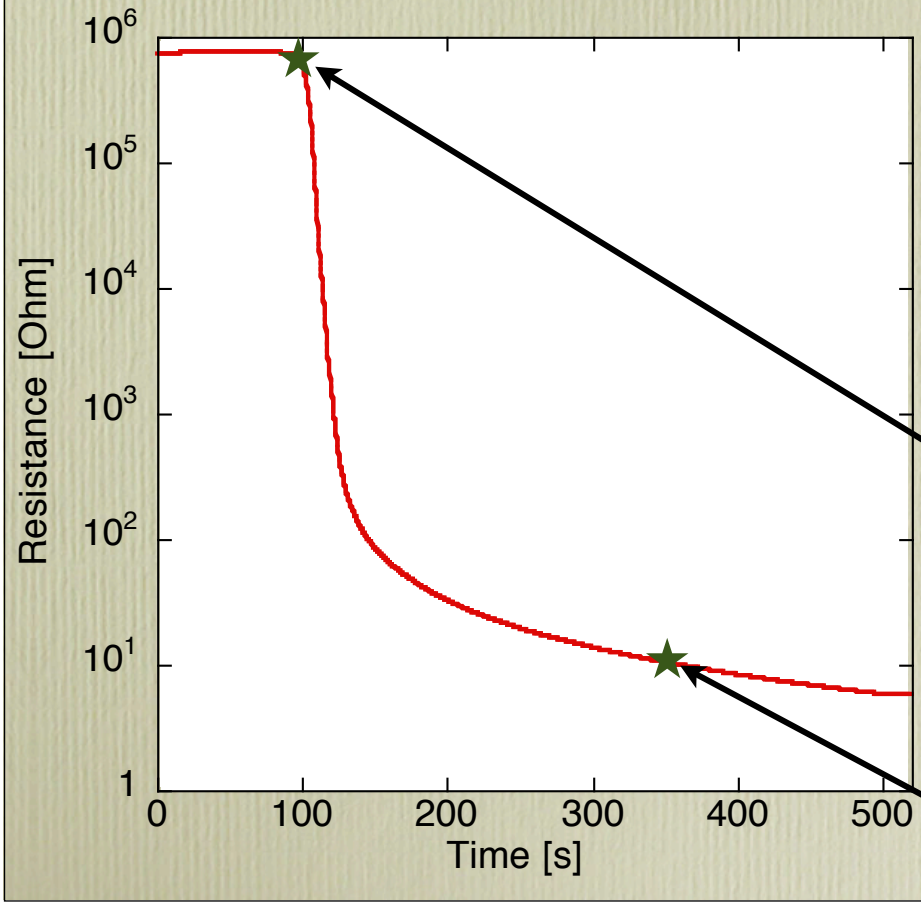


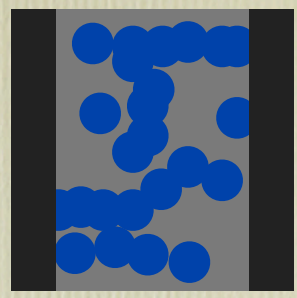
Measurement setup



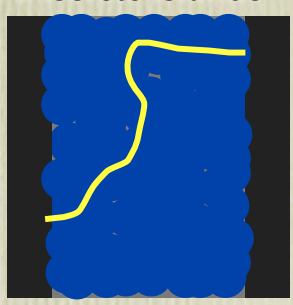
Resistance during growth

Pd on MgO at 200 °C





Discrete islands

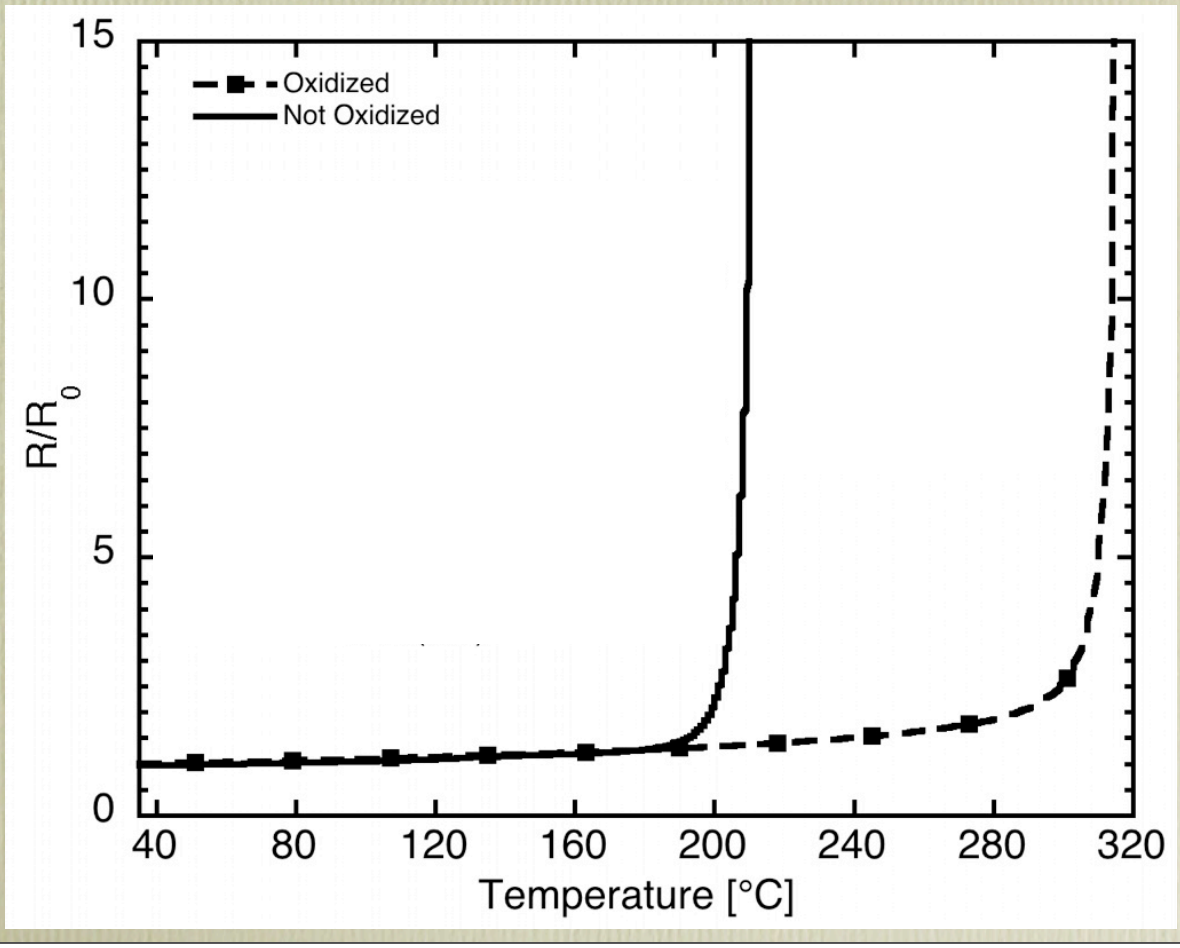


Coalescence thickness

Continuity thickness

What about evaporation and oxidation?

Evaporation of oxidized and not oxidized Mg



Hydrogen in magnesium, absorption and desorption

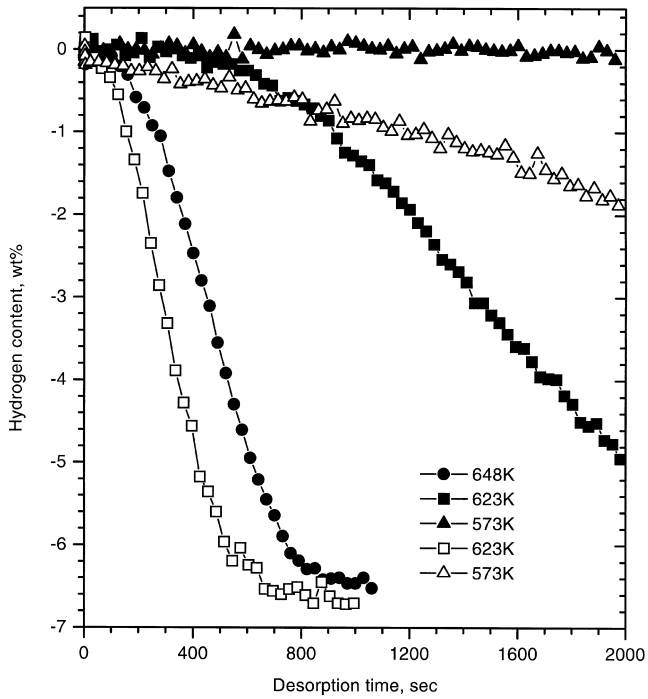


Fig. 3. Hydrogen desorption curves of unmilled MgH_2 (filled marks) and ball-milled (hollow marks) MgH_2 under a hydrogen pressure of 0.015 MPa.

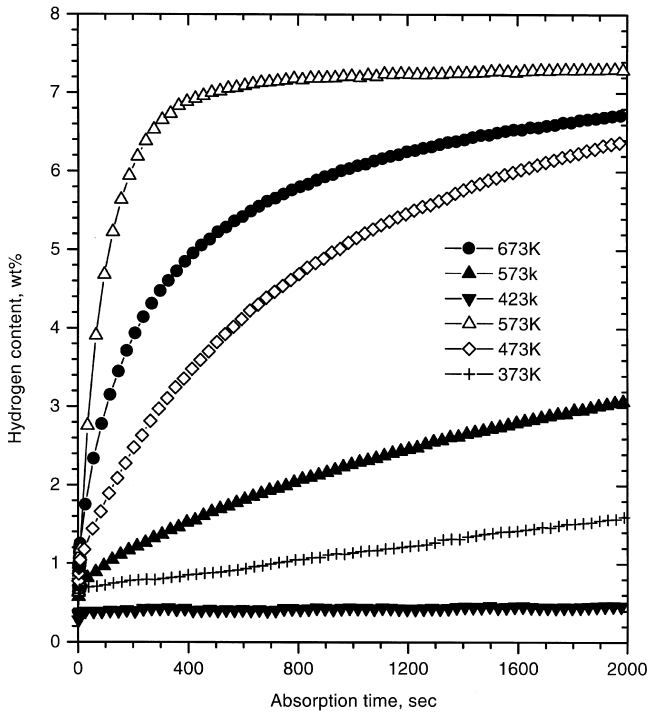


Fig. 4. Hydrogen absorption curves of the unmilled (filled marks) and ball-milled (hollow marks) MgH_2 under a hydrogen pressure of 1.0 MPa.

J. Huot, G. Liang, S. Boily, A. Van Neste, and R. Schulz. Structural study and hydrogen sorption kinetics of ball-milled magnesium hydride. *Journal of Alloys and Compounds*, 293-295:495–500, December 1999.