



### Name of the organization

SINTEF Material and Chemistry - Oslo

### Name of the infrastructure / laboratory

SINTEF-1: Membranes and Materials Research Laboratory (MMRL)

### Address and country of the infrastructure / laboratory

Forskningsveien 1, NO-0314 Blindern, Oslo, Norway

### Person responsible of the access / Contact person

Rune Bredesen / Thijs Peters

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### Main field of activity of the infrastructure / laboratory

- ▶ Stationary and Fuel Cells for Power and Heat Generation
- ▶ Hydrogen Production & Distribution

### Short description of the infrastructure / laboratory

The Membranes and Materials Research Laboratory facility at SINTEF in Oslo is dedicated to characterisation of advanced ceramic materials and membranes for high temperature gas separation and high temperature fuel cell applications. Material synthesis and thorough characterization is covered as well as membrane and fuel cell development and high temperature/high pressure testing of individual components and small modules/stacks. An advanced gas distribution infrastructure for multiple gasses (O<sub>2</sub>, H<sub>2</sub>, N<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, Ar, He, ...) and mixtures thereof is installed. The gas mass flow and pressure controllers are regulated by a PC and the gas composition of feed and permeate is monitored continuously by MS and GC units. Equipment is available for testing of fuel cell efficiency, hydrogen flux in membranes, conductivity measurements etc. This state-of-the-art facility has thus high degree of automation for gas control and monitoring. It provides data for studies of reactions kinetics, transport properties, and stability of materials e.g. used as adsorbents and membranes.

### Main research area(s) of the infrastructure / laboratory

Hydrogen production by ceramic and metallic high temperature membranes  
Characterisation of PCFC and SOFC fuel cells

### Instruments and tools available for the above mentioned research

- ProboStat™ units enabling membrane permeation measurements up to 1100 °C and 5 bar pressure
- Various in-house designed units allow for studies of permeation up to 40 bars and 600 °C (e.g. for studies of Water Gas Shift or Methane Steam Reforming)
- 3 TG measurement units that give the possibility to investigate materials from ambient conditions to high pressure (40 bars) – high temperature (1100 °C) conditions in the presence of harsh chemicals

