

**Hydrogen Production by High-Temperature
Water Splitting using Mixed Oxygen Ion-
Electron Conducting Membranes**

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Hydrogen production from water splitting at high temperatures has been studied using mixed oxygen ion-electron conducting cermet membranes. Hydrogen production rates were investigated as a function of temperature, water partial pressure, membrane thickness, and oxygen chemical potential gradient across membranes. The hydrogen production rate increased both with increasing moisture concentration and oxygen chemical potential gradient across membranes. A hydrogen production rate of $\approx 4 \text{ cm}^3/\text{min}\cdot\text{cm}^2$ (STP) was obtained with a 0.13-mm-thick membrane at 900°C in a gas containing 50 vol. % water vapor. The effect of membrane thickness and water partial pressure on the hydrogen production rate will be discussed in this presentation. Work supported by U.S. Department of Energy, National Energy Technology Laboratory, under Contract W-31-109-Eng-38.