

XI.5 Nano-Fabricated Hydrogen Separation Membranes (Phase I Project)

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DOE Grant Number: DE-FG02-05ER84238

The efficient and inexpensive production of hydrogen is essential for the hydrogen economy to become realized in the U.S. For the foreseeable future, most hydrogen will be produced from fossil fuels using a variety of processes. In order to fully utilize the hydrogen, efficient and inexpensive separation methods will be required. This project will develop a highly selective membrane for hydrogen separation from fossil-fuel-derived gas streams. In particular, zeolite membranes will be modified, in a controlled manner at the nanoscale, to obtain membranes which exhibit both high selectivity and high flux rates. In Phase I, zeolite membranes will be prepared and then modified using controlled, nanoscale techniques. The transport properties of the resulting, modified membranes will be evaluated to determine the utility of the proposed approach.