Crosslinked Hydrophilic Membranes for Gas Separation

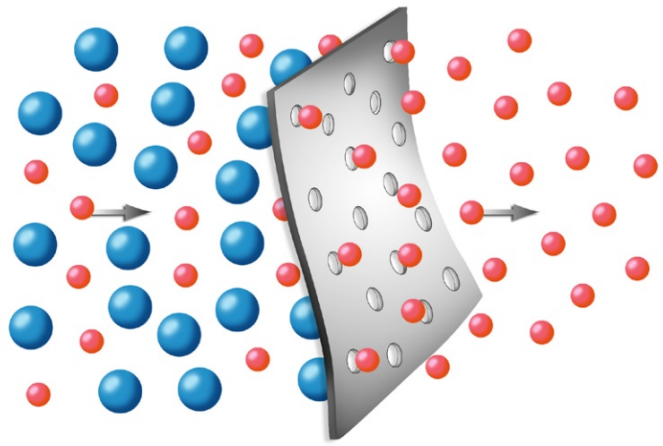
Dependence on nonrenewable energy sources has led to both economic and environmental problems across the globe. At current rates of depletion, natural gas reserves will be exhausted within 35 years, and petroleum reserves within 70 years (The Ecologist). Additionally, carbon emissions from burning of fossil fuels have caused a change in the carbon cycle and an increase in atmospheric carbon (EPA). To counteract these problems, more effort is being put forth to find new sources of renewable energy. Some of these renewable energy sources rely on the separation or removal of acid gases such as carbon dioxide, hydrochloric acid, and hydrogen sulfide from other gases. Current technology that separates gases has isolated absorption and desorption functions which makes the process less efficient. To create energy sources that are competitive with nonrenewable resources, the technology that separates and removes acid gases needs to be faster and more efficient.

THE MARKET

- This technology can be used for: decontamination of synthesis gas for fuel cells, biogas renewable energy, or the removal of greenhouse gases from flue gas.
- In 2013, the fuel cell industry sales broke the billion dollar mark, with revenues of approximately $1.3 billion. (Energy.gov)
- The hydrogen energy economy promises a non-polluting fuel that will reduce U.S. dependence on foreign oil. Any significant cost reductions achieved by manufacturers of reformers will provide meaningful cost reductions in complete fuel cell systems. (BCC Report EGY025A)

THE TECHNOLOGY

The Ohio State University researchers, led by Dr. W.S. Winston Ho, developed selectively permeable membranes that can be used for the separation and removal of gaseous forms of hydrochloric acid, carbon dioxide, and/or hydrogen sulfide from other gases. This technology is superior to industry standards such as aqueous amine absorption and molecular sieve adsorption because it combines the steps of absorption and desorption of the gas to the permeable membrane. By combining these into one step, the membrane overcomes thermodynamic equilibrium and capacity limitation resulting in an increased efficiency of the device.



INVENTOR

Dr. W.S Winston Ho received his BS from the National Taiwan University and both his MS and PhD from the University of Illinois at Urbana-Champaign. His research involves new membranes and materials for separation and fuel cells. Dr. Ho has presented at international conferences, published numerous works in book chapters and articles, and has been the recipient of several honors including his membership to the National Academy of Engineering.

THE OHIO STATE UNIVERSITY

CDME is supporting the commercialization of technologies that emerge from Ohio State's annual research efforts. Ohio State has one of the largest research and development budgets of all universities. The amount of annual funding is a leading indicator of the breakthrough innovation occurring within the University. Recent annual highlights from OSU:

» $934 Million: Total research and development (R&D) expenditures
» $470 Million: Federal R&D expenditures
» $101 Million: Industry-sponsored research expenditures

Whether your interest is in licensing, sponsored research, joint ventures, investment, corporate giving or placement of our best students, Ohio State is here to help accelerate your business through innovation

CONTACTS

CDME
1314 Kinnear Road, Columbus OH, 43212
cdme.osu.edu
Eric Wagner, Collaboration Manager
wagner.293@osu.edu • 614-477-0303

Technology Commercialization Office
Jason "Jay" Dahlman, Licensing Manager
dahlman.3@osu.edu • 614-292-7945