

CO₂ Separation from Pressurized Gas Stream Project
CSLF Project Status Report (PSR)
 November 2008

1. Project Location
Kyoto, Japan (membrane module development) Pittsburgh, Pennsylvania, USA (testing)
2. Project Lead
Dr. Shingo Kazama, RITE (Research Institute of Innovative Technology for the Earth) <ul style="list-style-type: none"> ▪ E-mail: kazama@rite.or.jp
3. Project Objectives
<ul style="list-style-type: none"> ▪ Development of membrane material for molecular gate function and composite membrane of excellent CO₂ selectivity over H₂ ▪ Development of membrane module ▪ Testing of the module (with NETL, USA)
4. Recent Milestones
<ul style="list-style-type: none"> ▪ Improvement of membrane material for molecular gate function (2008FY) ▪ Improvement of composite membrane of an excellent CO₂ selectivity over H₂ (2008FY) ▪ Pencil membrane module production (2009FY) ▪ Real gas pre-testing of pencil membrane module (2009FY) ▪ Preproduction sample of commercial size membrane module (2010FY) ▪ Real gas pre-testing of commercial size membrane module (2010FY) ▪ Process simulation (2008FY-)
5. Status
<ul style="list-style-type: none"> ▪ 1st duration: 11/2003 – 03/2006 Completed ▪ Development of novel dendrimer materials for CO₂ separation ▪ Fabrication of dendrimer composite membrane modules and their test <p>References:</p> <p>Shingo Kazama, Teruhiko Kai, Takayuki Kouketsu, Shigetoshi Matsui, Koichi Yamada, James S. Hoffman, Henry W. Pennline, Experimental Investigation of a Molecular Gate Membrane for Separation of Carbon Dioxide from Flue Gas, Session 30, Proceedings of Pittsburgh Coal Conference, Pittsburgh, USA (2006)</p> <p>Takayuki Kouketsu, Shuhong Duan, Teruhiko Kai, Shingo Kazama*, and Koichi Yamada, “PAMAM Dendrimer Composite Membrane for CO₂ Separation: Formation of a Chitosan Gutter Layer”, <i>J. Membrane Sci.</i> 287 (2007) 51-59 and so on.</p> <ul style="list-style-type: none"> ▪ 2nd duration: 04/2006 – 03/2011 ongoing ▪ Development of novel CO₂ molecular gating materials for a CO₂/H₂ mixture ▪ Test of dendrimer composite membrane under an elevated pressure (12/2007) ▪ Accomplishment of a good CO₂/H₂ selectivity at an elevated pressure (3/2008) ▪ Improvement of CO₂ permeation rate of dendrimer composite membrane (12/2008)