Novel Transformational Membranes and Process for CO_2 Capture from Flue Gas

DE-FE0031731

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2019 NETL Technologies Integrated Review Meeting
Pittsburgh, PA, August 29, 2019

Project Objective

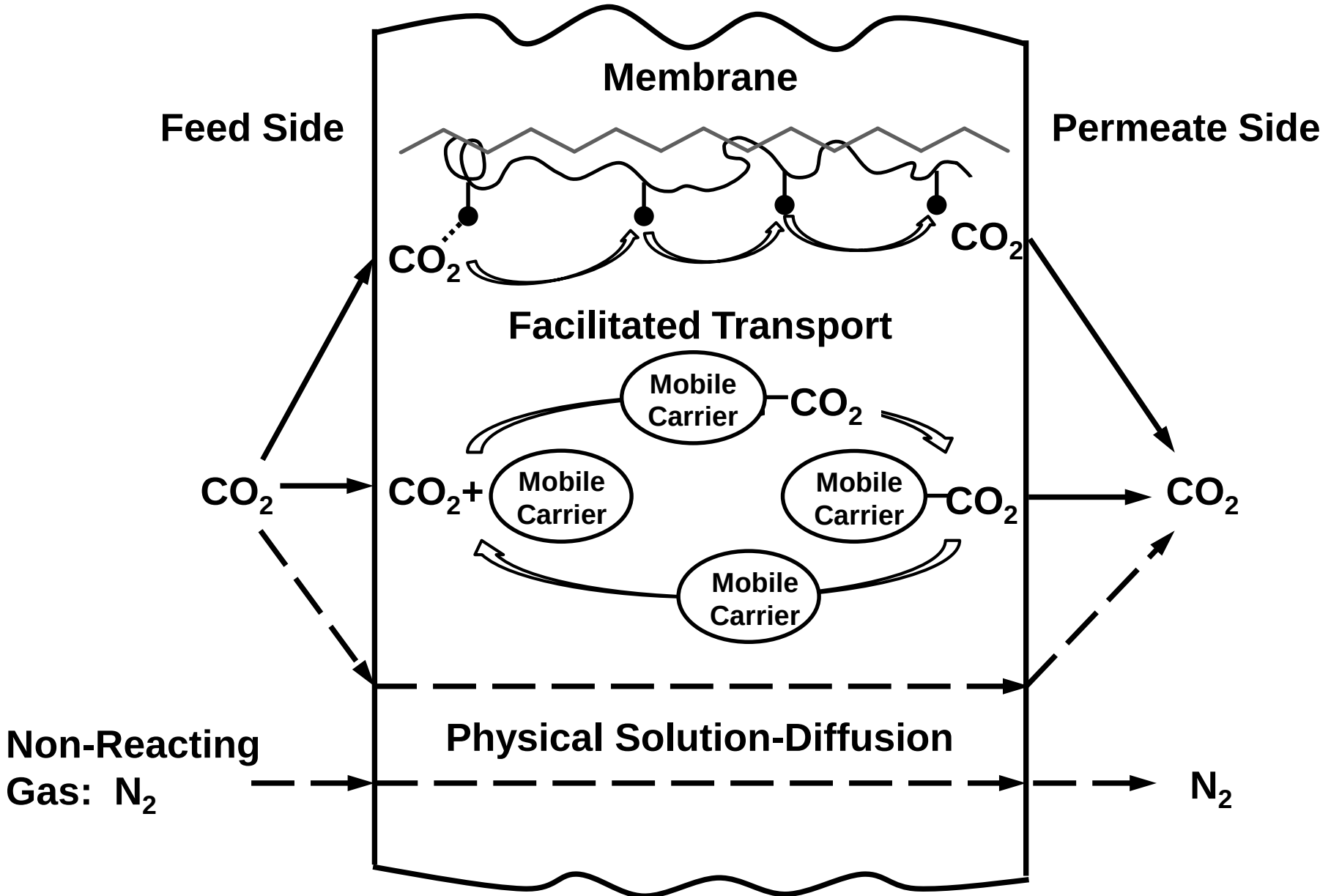
- **Develop a cost-effective design and fabrication process for a novel transformational membrane and its membrane modules that capture CO_2 from flue gas**
  - **95% CO_2 Purity**
  - **60 – 90% CO_2 Recovery**

2-Budget Period Project

- **BP1: 07/01/2019 – 12/31/2020**
  - **Material design aided by advanced computation**
  - **Laboratory-scale membrane synthesis, characterization and transport performance studies**
  - **High-level preliminary techno-economic analysis**
- **BP2: 01/01/2021 – 06/30/2022**
  - **Fabrication, characterization and transport performance studies of scale-up membrane (21″ wide)**
  - **Fabrication and characterization of prototype spiral-wound membrane modules (8″ diameter & 20″ long)**
  - **Construction and field testing of integrated membrane skid with actual flue gas**
  - **Update techno-economic analysis by Gas Technology Inst.**

- **Integrated program with fundamental studies, applied research, synthesis, characterization and transport studies, and high-level techno-economic analysis**

Amine Polymer Layer Contains Mobile and Fixed Carriers: Facilitated Transport



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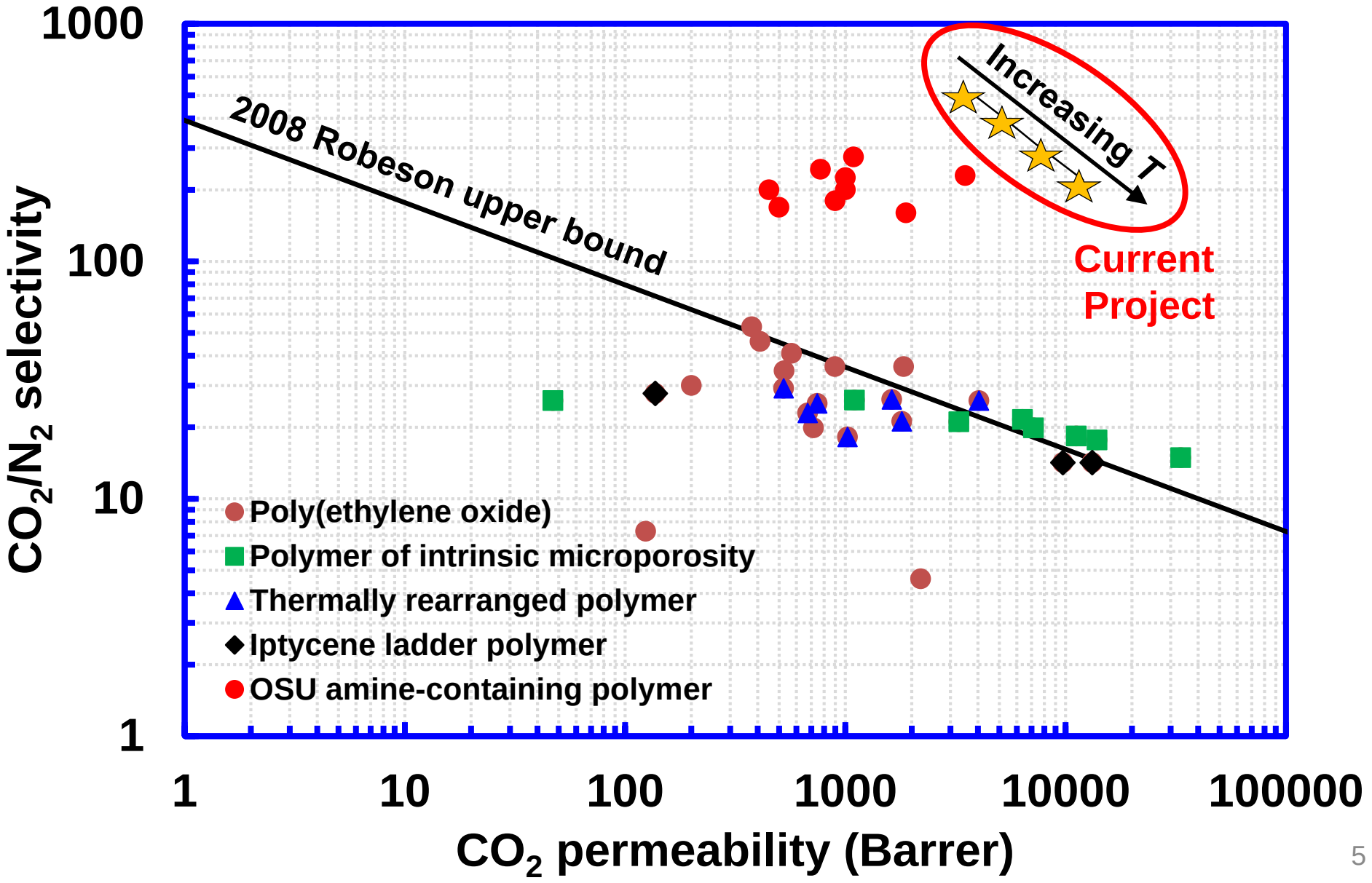
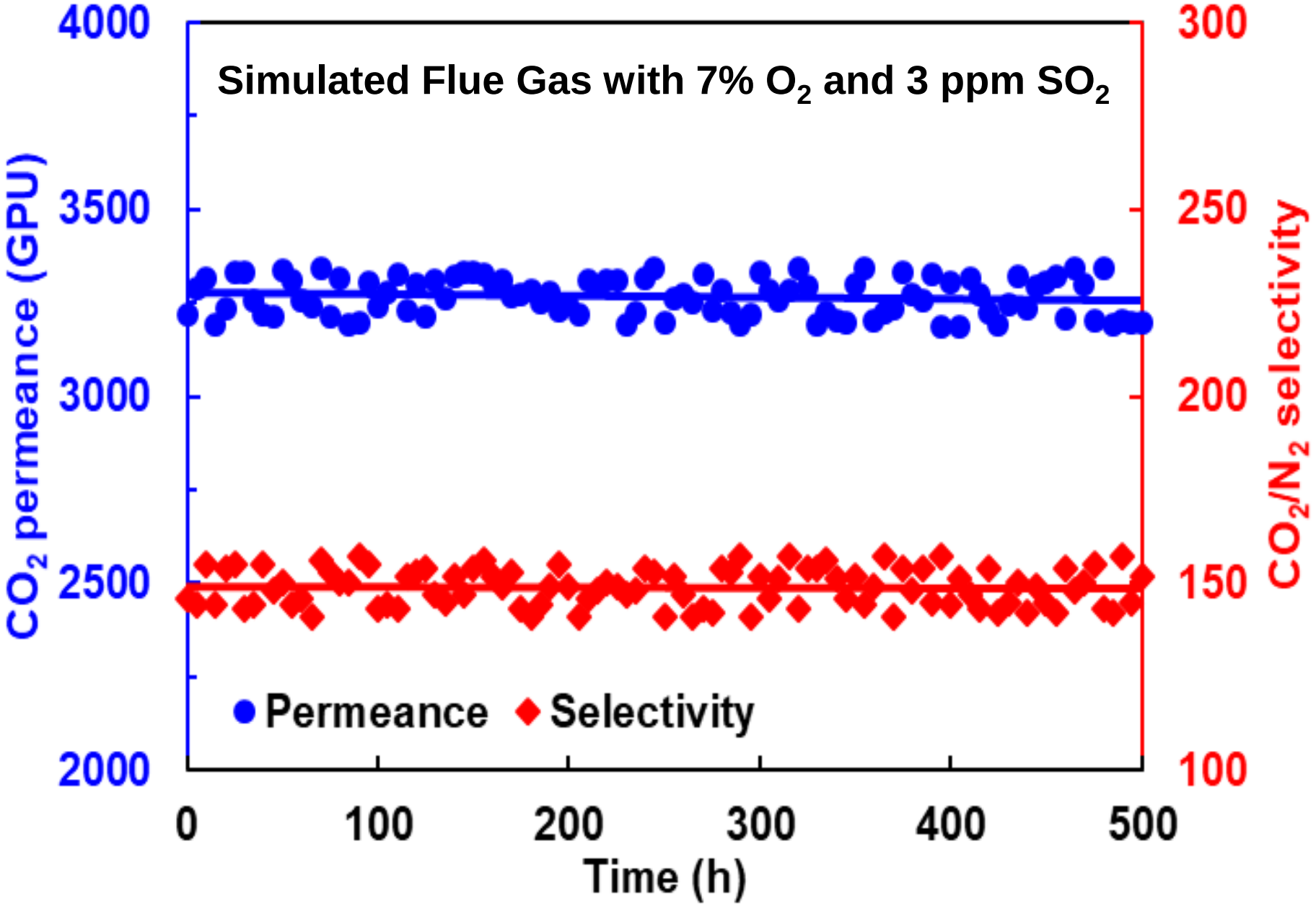


Good Membrane Stability Obtained



Acknowledgments

Andy Aurelio & José Figueroa, DOE/NETL

Financial Support

DOE/NETL

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- **Federal funding for membrane development**