ADSORPTION PROCESS FOR CO\textsubscript{2} CAPTURE: AN OVERVIEW

By

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Abstract

Adsorption processes for CO\textsubscript{2} capture have gained significant attention in the last decade with hundreds of reports on new adsorbents and processes for capture and removal of carbon dioxide from a range of gas streams. To date, the only commercial examples are removal of trace carbon dioxide in gas streams such as LNG and ASU upstream molecular sieve units. There are no commercial examples of the use of adsorbents to capture carbon dioxide by adsorption processes and deliver a stream of high purity carbon dioxide for sequestration or further processing. In this study, we present the range of processing options available for CO\textsubscript{2} capture using adsorbents and show how these processes must be adapted to the condition of the feed stream. We also show how these processes make requirements of the adsorbents (or adsorbent systems) and highlight what features new adsorbent should have to help advance adsorption technology. Specific examples of near commercial adsorption processes will be discussed, e.g. vacuum swing adsorption, high temperature dry regenerable fluidized bed systems, and rapid temperature swing systems.

Biography

Professor Paul Webley is Head of Department of Chemical Engineering and Director of the Clean Energy Laboratory at The University of Melbourne. He is former manager of the Carbon Capture Program for the CO2CRC and Director of the Peter Cook Centre for Carbon Capture and Storage at The University of Melbourne. Paul has worked in development and implementation of carbon capture technologies for the past 15 years in industry and academia. His principal research interest is clean energy technologies particularly gas separation, energy storage, and applications of thermodynamics to improve process efficiency. He is the author of more than 200 papers in scientific journals and books, 15 patents, and more than 100 contributions to international and national conferences.

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