Post-doctoral Thermodynamic

Ecole/Institution/Société:
Universidade Federal do Ceará , Brazil / Ceará

Discipline:
Chemical Engineering

Type d'emploi::
Full-time

Date de publication:
2021-10-16

Personne à contacter:
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Post-doctoral Thermodynamic

Job Categories

- Post-Doc

Academic Fields

- Chemical/Petroleum
- Engineering - Other

Research theme area:

Optimisation-based design of Temperature Swing Adsorption (TSA) systems for CO 2 capture from biomass-derived gases at large scale

Abstract

Biomass-derived combustion flue gases contain 10 to 15% CO2, N2, excess O2 and water deriving from combustion, along with variable amounts of other components derived from the biomass, such as NOx, SOx. Besides, such gases may have still other components depending on the biomass origin.

Lignocellulosic biomass may contain alkaline and alkaline earth metals associated with the use of fertilizers, which vapors may or may not condense, depending on the temperature. Municipal waste biomass contains siloxanes. Sugar cane bagasse may contain traces of metals.

The interaction of these components, even with state-of-the-art adsorbents, is poorly understood.

Consequently, in order to develop a carbon capture process based on adsorption of CO2 from biomass-derived flue gas, experimental knowledge must be gathered on the interaction of such gas with the adsorbent. This is the subject of the research to be carried out in Project 66.

This understanding will help develop neutral or negative greenhouse emission solutions for energy generation. Besides, due to its geography, Brazil has favorable conditions for biomass-based energy generation, so this research will help strengthen the national oil and gas industry in a global perspective.

Description

The applicant to the Post doc grant object of this call is expected to engage in experimental activities and contribute in line with the main objectives of project 66:

- Understand the thermodynamics and kinetics of adsorption of CO2 present in biomass flue gases, in competition with other contaminant species according to the biomass origin.
- Evaluate the modifications of adsorbents to enhance its efficacy in CO2 capture from biomass-derived flue gases.

Requirements to fill the position

This project requires a highly motivated candidate with outstanding abilities for multidisciplinary teamwork and scientific communication. Knowledge of experimental scientific method and proficiency in English are required. The whole experimental work will be carried out at Universidade Federal do Ceará and the approved candidate should agree to live in Fortaleza.

- The postdoc candidate should hold a PhD in Chemical Engineering, with proven experience in gas adsorption on porous solids, including techniques of adsorbent characterization; acquisition of experimental data of adsorption equilibrium and kinetics; and modelling of adsorption-based separation processes, particularly in fixed-bed operation.

INFORMATION ABOUT FELLOWSHIP:

This Postdoc fellowship is funded by FUSP. The fellowship will cover a standard maintenance stipend of R$ 7.373,10 per month.

MORE INFORMATION:

https://www.rcgi.poli.usp.br/opportunities/

Position: Post-Doctoral REF: 21PDR133

Contact

RCGI

Human Resources

University De São Paulo

Av Prof Mello Moraes, 2231

Cidade Universitaria - Butanta

Sao Paulo, Sao Paulo 05508-030

Brazil

Email:rcgi.opportunities@usp.br

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