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Réseau d'excellence
des sciences de l'ingénieur
de la Francophonie

CO_2 CAPTURE USING MEMBRANE CONTACTORS

This study focuses in the CO_2 capture leading to obtain a carbonate compound as a final recovery product.

Objectives

The aim of the research project is the evaluation of the technical viability of membrane absorption using reactive mixtures for CO_2 capture.

The specific objectives are as follows:

- Feasibility study on the treatment performance of a commercial membrane for CO_2 capture in flue gas mixtures.
- Feasibility study on the treatment performance for CO_2 capture of a traditional absorption column in flue gas mixtures.
- -Applicability study on membrane based treatment technology for CO_2 capture (economic and environmental evaluation).

Overall research content

- Review of the State of the Art focus on CO_2 capture with traditional equipment (absorption columns, etc.) and membrane technology (membrane contactors, especially) in order to acquire knowledge and support to the tasks that will be developed during the experimental step.
- Experimental study: traditional equipment (absorption column) vs new technology (membrane contactor). Study of the influence of the concentrations and flows of feed (mixture of CO_2:0-15%) and NaOH solutions (0-2M). Other solutions (Na_2CO_3, NaOH-Na_2CO_3, etc.) are also contemplated.
- Characterization study: Analysis of the parameters evolution during the experiments and further study of the final composition of the samples (titration, microscopy, etc.)
- Theoretical study: Microscopic modeling of the technologies studied (result analysis and modeling of process behavior) and economic analysis of the efficiency and viability.

Qualification requirement

Students with background of environmental/chemical engineering with good laboratory skills.