



“Gheorghe Asachi” Technical University of Iasi, Romania



PACKED COLUMN SIMULATION FOR CO₂ CHEMISORPTION IN ACTIVATED SOLUTIONS

**Elisabeta Droniuc Hultuana¹, Lidia Favier², Lacramioara Rusu³,
Igor Cretescu^{4*}, Gabriela Ciobanu¹, Maria Harja^{1*}**

¹*“Gheorghe Asachi” Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection, Chemical Engineering Department, 73 Prof.dr.doc. Dimitrie Mangeron Blvd., 700050 Iasi, Romania*

²*University Rennes, Ecole Nationale Supérieure de Chimie de Rennes, CNRS, ISCR – UMR6226, F-35000 Rennes, France*

³*“Vasile Alecsandri” University of Bacau, Faculty of Engineering, 157 Mărășești Blvd., 600115, Bacau, Romania*

⁴*“Gheorghe Asachi” Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection, Department of Environmental Engineering and Management, 73 Prof.dr.doc. Dimitrie Mangeron Blvd., 700050 Iasi, Romania*

Abstract

Apart of new equipment's development such as absorption columns with higher efficiency, for chemical industry, there is a strong need for greenhouse gases reduction in order to assure the environmental protection and, consequently, many studies regarding the purification methods of exhausted gases have been performed. There are several types of reactors used for gases purification, such as: bubbling jet reactor, combined packed and spray tower absorber, cable wet scrubber and packed column. Among these, chemisorption in packed column was considered and analysed in this paper because of its increased absorption rate achieved by adding of activators and providing a good contact between liquid and gas phases.

Using a validated model at industrial scale, the performance of a packed column under various conditions was assessed, aiming to establish the effects of several parameters as temperature, pressure, activator concentration, transformation degree, initial solution concentration, etc. on the purification process performance. Based on the obtained results, new reactors for purification of the exhausted gases generated from burning process of fossil fuels, can be designed.

Key words: activated solution, chemisorption, influence of parameters, packed column

Received: January, 2019; Revised final: February, 2020; Accepted: February, 2020; Published in final edited form: February, 2020

* Author to whom all correspondence should be addressed: e-mail: icre@tuiasi.ro; mharja@tuiasi.ro