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INTEGRATED NETWORK OF CONTINUOUS REACTORS FOR THE DECONTAMINATION OF GASEOUS STREAMS IN HETEROGENEOUS CATALYTIC GAS-LIQUID-SOLID SYSTEMS

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Abstract

In this paper integrated network of continuous reactors for the decontamination of gaseous flows in heterogeneous catalytic gas-liquid-solid – also applicable for bioremediation systems is investigated. For this purpose, during process integration we have identified strategies to develop an optimal system for a variety of well-defined requirements and to discover ways to ensure cost efficiency to achieve the requirements of sustainable industry in the frame of knowledge-based sustainable economy. One of the solutions for integration consists in the combination of chemical reactions with separation processes in single units. In this paper, the dividing wall column description has been extended to cover reactive systems, which results in a new configuration called the reactive dividing wall column. This process offers a higher degree of integration to achieve additional synergistic effects. The model has been applied for the methyl acetate hydrolysis.

The paper underlines that the analyzed system is very efficient from dynamic and functional point of view, with favorable consequences to reduce equipment number, utilities consumption and capital investments comparing with conventional systems. Those were created the premises for using these integrated solutions for the decontamination of flows in heterogeneous catalytic gas-liquid-solid systems.

Key words: integrated network, process integration, dividing wall column

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