

POLITECHNIKA ŚLĄSKA

WYDZIAŁ CHEMICZNY

Katedra Aparatury Chemicznej i Procesowej

PRACA DOKTORSKA

Badania nad zastosowaniem hybrydowej półki
katalitycznej w procesach wymiany masy

*The studies on the application of a hybrid, catalytic plate by the processes
of mass transfer*

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Streszczenie w j. angielskim

The PhD contains research on hybrid catalytic tray, enabling simultaneous implementation of chemical reaction and vapour-liquid mass transfer. Within the carried out research program there has been developed both the correlation equation for gas phase pressure drop and process efficiency.

Obtained hydraulic correlation allows rational selection of design features in determining the operating parameters of the adjustment pressure distribution in the column.

Based on studies of the mass transfer process, using a model of the absorption of the rapid, irreversible chemical reaction (air - carbon dioxide - sodium hydroxide), an equation for the correlation for the mass transfer resistance

The work presents a new type of algorithm-based design column tray involving CHEMCAD process simulator and VBA programming.

Conclusions

HPK (hybrid catalytic plate) despite mounting containers is characterized by moderate pressure drop and higher process efficiency, compare to a traditional sieve tray. The specific design of the new design tray, in the non-catalytic variant, allows to extend the applicability of the typical processes of absorption. During the study of carbon dioxide absorption the efficiency of the process was denoted about 15 to 30% higher than for standard sieve tray. Therefore presented considerations could be applied to CCS technology.