

Letter to the Editor

In “Improving Selectivity During Methane Partial Oxidation by Use of a Membrane Reactor”, (Catal. Lett. 12 (1992) 395) a comparison is made between a reactant-swept catalytic membrane reactor and a plug-flow reactor. The two reactors are compared using a plot of selectivity as a function of conversion. Figs. 1a and 1b show a sketch of the two reactors used in this comparison. Conversion and selectivity were calculated based upon the streams entering and leaving the system enclosed by dashed lines in the figures. On this basis the membrane reactor outperforms the plug-flow reactor.

The system contained within the dashed lines of the reactant-swept catalytic membrane reactor (fig. 1a) includes product separation whereas the plug-flow reactor used in comparison (fig. 1b) does not. The plug-flow reactor system can be modified so that it, too, includes internal product separation (fig. 1c). When the reactant-swept catalytic membrane reactor of fig. 1a is compared with a plug-flow reactor like that shown in fig. 1c (keeping the amount passing through the separation equal), it is found that the plug-flow reactor performs as well as or better than the membrane reactor.

The purpose of the present communication is to point out that the original paper only used the former basis of comparison, and consequently it may be

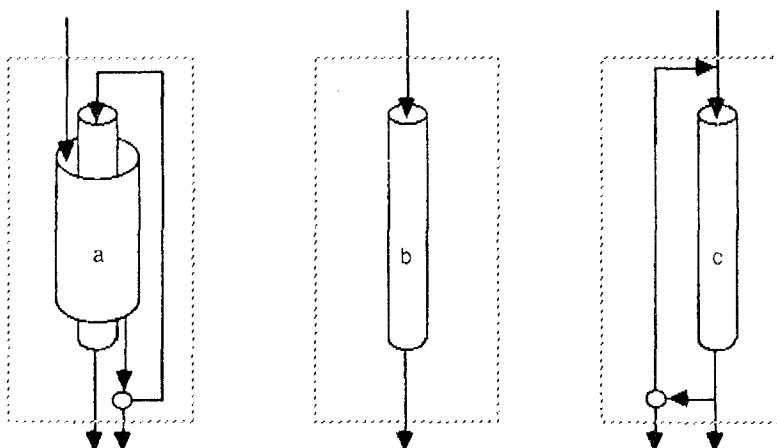


Fig. 1. Schematic diagrams of (a) a reactant-swept membrane reactor and (b), (c) plug-flow reactors which may be used for comparison. The small circle represents a product separation step.

misleading. The latter basis of comparison may not be equitable in all cases, either. For example, in a real membrane reactor the sweep gas may be at a lower temperature than the tube-side reactant stream (it may be used to partially cool the tube side), and it may be at a different pressure, also. In such situations, which were not treated in the original comparison, the product separations for the two reactors would not be equivalent.

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