PREPRINTS OF PRESENTATIONS

INTERNATIONAL SYMPOSIUM ON MEMBRANES FOR GAS AND VAPOUR SEPARATION

FEBRUARU27-MARCH5
1989

SUZDAL, USSR

THE MASS-TRANSFER CONTROL IN MEMBRANES

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The critical analysis of the different methods of the membrane gas separation control are carried out in terms of the general approach. The following methods are considered:

1. The selection of the spatial structure of heterogeneous material which provides the achievement of the optimal gas separation features.

2. The choice of unsteady-state separation processes (pulse version of the permeation method, concentration waves methods etc.).

3. The using of traveling membranes for the spatial separation of gas mixture components.

The mathematics simulating of the gas permeation kinetics (single gas and mixtures) for heterogeneous membranes was fulfilled in framework of generalized phenomenological theory of gas diffusion in non-homogeneous medium of the both stable and undergoing space-time rearrangements during the diffusion processes. The introducing of the continuous geometrical factor notion made possible to begin systematic selection of the heterogeneous medium in order to achieve the best membrane selectivity and permeation. It is shown that different structures are optimal in the dependence on the concrete object of membrane technology (purification of penetrant flux after membrane, concentration of the desired component above the membrane).

The prospects of application of the different unsteady-state diffusion processes are studied. The algorithms of the optimum exit gas concentration function selection are developed which provide the achievement of the high selectivity meanings.

The mathematics simulating of the membrane travelling elements was carried out and the prospect of the application their is considered for separation of the multicomponent mixtures.

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