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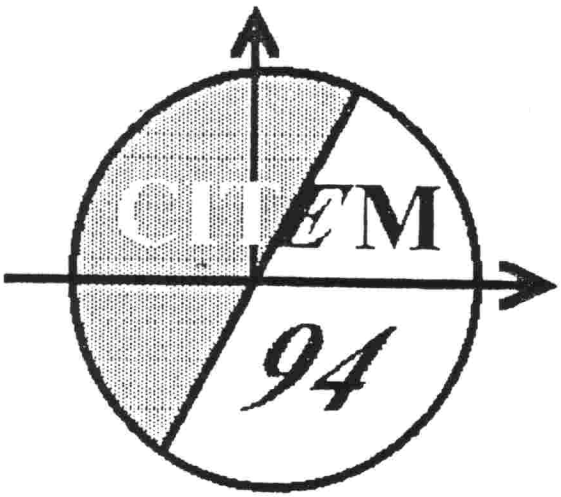

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FLOWING LIQUID MEMBRANE SYSTEMS FOR RECOVERY AND SEPARATION OF VALUABLE GAS COMPONENTS.

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The selectivity of gas mixture separation by passive gas diffusion through polymeric membranes is restricted by selectivity of membrane itself. These restrictions can be overcome by using of the facilitated or active transport of gases.

In this paper the integrated membrane systems (IMS) with flowing liquid layers of absorbents for multicomponent gas mixture separation are developed. Particularity of TMS is the application of non porous gas separating membranes with moving liquid between them. Sterile properties of membranes provide the protection from the liquid or gas medium (for example, in bioreactors).

The pure liquids, the water solution of inorganic salts or organic solids, the solution of complex salts irreversibly interacted with one of components of mixture separated, slurries of microorganisms which transform one of components into other type have been used.

General mathematical description of different gas-liquid membrane modules is considered. Main modes of them include the flowing one and the combination of two or more modules in recycle. Construction of system can includes the regeneration step. First type can be used as selective membrane valve for three-components mixture separation. The separation of $CO_2/CH_4/H_2$ mixture on technical grade components by using polyvinyltrimethylsilane (PVTMS) membranes and different liquids has been done. The experimental results are considered in the frames of the gas diffusion through multilayer membranes with flowing liquid layer. Second type of integrated membrane modules can be effectively used for two-components mixture separation (for example, biogas or alkeno/alkane mixture). In this case the multilayer PVTMS membrane modules with operating surface $\approx$ 1 m^2 were used. Selectivity for CO_2/CH_4 more than 1000 under good level of productivity were achived. Substantially more selectivity for C_2H_4/CH_4 mixture separation by using specific carriers was obtained.

The problems and opportunities of the polymeric membrane selection and module design are considered.