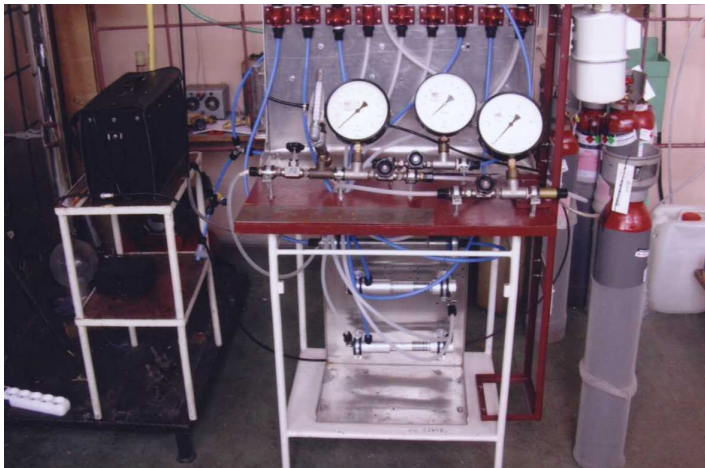


Biogas enrichment in methane

Enrichment of methane in biogas to have valuable fuel can be achieved by removal of carbon dioxide, that constitutes about 30–45% of biogas produced in fermentation process. Elimination of carbon dioxide from the flue gas helps to increase its calorific value and to eliminate the greenhouse gas CO₂. Current technologies for biogas purification and methane enrichment are physicochemical methods such as chemical separation, membrane separation, cryogenic separation as well as adsorption. Chemical methods are based on absorption under elevated pressure (in water, 30% solution of potassium carbonate, solution of monoethyloamine, etc.).

The experiments showed that with the use of capillary module with polyimide membranes it was possible to achieve the enrichment of CH₄ from the concentrations of 55–85% up to 91–94.4%. The membrane material was resistant to the small concentrations of sour gases and assured the reduction of H₂S and water vapour concentrations, as well. The required enrichment was achieved in a single module, however to prevent CH₄ losses the multistage or hybrid systems should be used to improve process efficiency.



Laboratory stand for gas separation



UBE capillary module for CH₄ and CO₂ separation

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