Institute of Chemical Engineering

The enrichement of low-concentrated impurities in air using an experimental pressure swing adsorption installation

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Abstract: In the case of experimental investigations concerning methane enrichment in the air it is necessary to avoid a rise of CH_4 concentration above 5 vol.% i.e. its lower explosive limit. In order to determine experimentally safe ranges of pressure swing adsorption (PSA) parameters and the maximum level of the enrichment CO_2 was considered as a low-concentrated impurity in the air instead of methane because of higher adsorption capacity and selectivity towards nitrogen and oxygen in available adsorbents. Experimental results are therefore presented of the enrichment of CO_2 (0.24-0.69 vol.%) mixed with the air. It was found that the concentration of carbon dioxide in a CO_2-enriched stream is up to seven times higher than that in the raw gas. It was also concluded that in all experimental cases CO_2 concentration in the CO_2-enriched stream did not exceed 5 vol.%.

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