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The enrichment 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 CH₄ 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 CO₂ 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 CO₂ (0.24-0.69 vol.%) mixed with the air. It was found that the concentration of carbon dioxide in a CO₂-enriched stream is up to seven times higher than that in the raw gas. It was also concluded that in all experimental cases CO₂ concentration in the CO₂-enriched stream did not exceed 5 vol.%.

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