

Adsorption breakthrough characteristics of H₂S in CH₄ on zeolite 3A and 5A

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Sulfur compounds must be removed from natural gas because of corrosion of processes and catalyst poisoning, let alone ever strict environmental regulations. The sulfur concentration in natural gas should be removed to the level of 1 ppm for utilization in pipeline grade.

In general, a process using an aqueous alkanolamine solution is used for desulfurization of raw natural gas from a well. However, this process requires high energy for regeneration, and corrosion of the device and loss of solution can occur. Therefore, after treating natural gas through the process operated at a limited condition, the treated natural gas still contains a certain level of sulfur compounds. Then, to purify natural gas, the adsorption technology is wide used a secondary unit.

In this study, the adsorption breakthrough characteristics of H₂S on zeolites 3A and 5A were conducted because zeolite A is cost-effective and widely used in industries. H₂S of 50 ppm balanced by CH₄ was used, and the breakthrough results at 9 bar and 45°C were compared.