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THERMAL STUDY OF ADSORBENTS PREPARED FROM WASTE TYRES

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Abstract

Carbonaceous materials were obtained from waste tyres and their potential application as hydrogen sulphide adsorbents was investigated. The adsorbents were obtained by pyrolysis of waste tyres and physical (CO₂) or chemical (KOH) activation at 550 and 800°C. The effect of modification conditions on the performance of waste tyres based materials as adsorbents of H₂S at room temperature in dry and wet conditions was investigated. Sorption capacity of such adsorbents was found to strongly depend on the temperature and type of modification. Thermogravimetric analysis indicated that the temperature ranges of the mass loss maxima in the samples before and after H₂S adsorption process are different. The most significant difference is the appearance of a new peak with a maximum at about 880°C, which can be assigned to the release of compounds containing a sulphur group, generated as a result of H₂S adsorption, indicating their strong thermal stability. Moreover, according to TG results the sulphur groups can undergo not only physisorption, but also chemisorption on the surface of adsorbent.

Key words: chemical activation, H₂S adsorption/reduction, pyrolysis, physical activation, waste tyres

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