

عنوان مقاله:

Nanoporous silica aerogels as adsorbent to remove para xylene vapors from waste gas streams

محل انتشار:

هفتمین کنگره ملی مهندسی شیمی (سال: 1390)

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خلاصه مقاله:

Volatile organic compounds are the most environmental pollutants that their emission caused serious problems in human health and environment. Adsorption of these compounds on porous adsorbents is a simple technology capable of recovering organic compounds. Silica aerogels were synthesized by sol-gel method applying cheap precursor, sodium silicate, and Ambient pressure drying. The samples were characterized by SEM, BET and FTIR. The adsorption performance of the aerogels was measured under static and dynamic conditions at ambient temperature and pressure and then results were compared with the industrial activated carbon. The effects of parameters like concentration, pollutant flow rate and hydrophobicity or hydrophilicity property were investigated in adsorption process by obtaining breakthrough curves. Increasing of the concentration and flow rate of pollutant stream increased amount of adsorption. Hydrophilic silica aerogel showed higher amount of adsorption rather than hydrophobic one and industrial activated carbon because of having high surface area of 810 m²/gr. The highest amount of adsorption was obtained about of 195 mg/g. Also results showed that silica aerogels have several times higher adsorption capacity than industrial activated carbon.

کلمات کلیدی:

Volatile organic compounds, Silica aerogel, Adsorption, Breakthrough curve, Ambient pressure drying

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