

# Equilibrium Gas Adsorption of Propane and Propylene on Zeolite 5A Using Magnetic Suspension Balance

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## Abstract

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The adsorption equilibria of pure propane and propylene on zeolite 5A were measured at 273 K, 303 K and 343 K in the pressure range (0.04 to 8) bar using a new magnetic suspension balance. For this measurement no additional concentration measurement is required, neither for the gas phase nor for the adsorbed phase. The new instrument, experimental procedure and evaluation have been discussed by performing equilibrium adsorption of pure propane and propylene on a commercial 5A zeolite. Correlation of experimental results by Toth equation and comparing the results with previous works have been showed good agreement.

*Keywords: Zeolite 5A, Equilibrium measurement, Magnetic suspension balance*

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## Introduction

Adsorption of gas or vapor mixture on porous solids, like activated carbon or zeolite, is a widely applied operation in separation technology, such as gas separation, drying of gases, and purification of exhaust air[1]. The development, design and operation of these process requires knowledge of adsorption equilibria.

Concerning to development technical instrument for adsorption measurement a new magnetic suspension balance has been employed to measure equilibrium adsorption of propane and propylene in zeolite 5A. In the present study, the principle behind the measurements, the instrument and the measurement procedure is discussed in detail. Experimental data and its correlation with Toth model referring to the adsorption of propane and propylene in a wide range of temperature and pressure will be given and discussed to a certain extent.

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