

8th International conference on
Recycling, Pollution Control and Waste Management
August 06-07, 2021 | Webinar



**Reza Zahedi, Ghafourian, Y Zaman,
Sh Khoramnejhadian and R Dabbagh**

Islamic Azad University, Iran

**Study of carbon dioxide and methane adsorption on carbon
molecular sieves, raw and modified by waste engine oil**

In this study, a carbon molecular sieve (CMS) was synthesized from walnut shells, followed by physical activation of the carbon content of the CMS. Adsorption of CO₂ and CH₄ onto raw and acid treated adsorbents was investigated using two sizes, 300–600 and 600–1180 μm. The adsorbents were impregnated with two solvent mixtures of waste engine oil with kerosene and with thinner at a proportion of 1:1 at 25 °C. The highest adsorption for CO₂ and CH₄ was obtained at the suitable size of a group of CMS (A) adsorbents, with acid treated adsorbents being more efficient than the raw adsorbents. The acid treated CMS (A-3) sample adsorbed 0.925 mmol CO₂ g⁻¹ and 0.353 mmol CH₄ g⁻¹. The results indicated that by decreasing the granulation size of group CMS(R) adsorbents, the adsorption capacities for CO₂ and CH₄ were reduced while increasing the granulation size of group CMS (A) adsorbents resulted in an enhancement in the adsorption capacity for CO₂ and CH₄. Moreover,

acid treated adsorbents achieved enhanced adsorption capacity for CO₂ and CH₄. Further modifications reduced the adsorption capacity for CO₂ and CH₄ in impregnated adsorbents, due to a decrease in surface area, pore volume and pore size of the adsorbent.

Biography

Reza Zahedi, was 48 years old. He received his PhD in Pollution Environment from Department of Environment, Damavand branch, Islamic Azad University, Damavand, Iran on the November 1 2020. His thesis title is "Preparation of Modified Carbon Molecular Sieve by Used Oil for Separating Carbon Dioxide and Methane" and he has written 3 papers related to my thesis. He has been teaching HSE and ISO 14001 and ISO 45001 and waste management for industrial and service units for about 10 years. His research interests are the remove and adsorption of air and water pollution. He is the managing director and owner of magazine Environment and Tourism in Persian language.

e: rezazahedi7@gmail.com