

Nobel method for xylene removal from air on nano activated carbon adsorbent compared to NIOSH approved carbon adsorbent

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Abstract

Introduction: Volatile organic compounds such as xylene are one of the main air pollutants. Adsorption method are of the most common methods used in the control of volatile organic compounds. The aim of this study was to investigate the xylene removal from air through nano activated carbon adsorbent in comparison with NIOSH approved carbon adsorbent.

In this study it is tried to follow-up the efficacy of motor oil quality on engines sound level.

Material and Method: Xylene adsorption tests on nano activated carbon and activated carbon in static mode (batch) were done in glass vials with volume of 10 ml. Gas chromatography with FID detector was used for analysis. Various variables including contact time, amount of adsorbent, concentration of xylene, and temperature were studied.

Results: Absorption capacity of xylene at ambient temperature (25° C) in static mode and duration of 10 minutes for activated carbon and nano activated carbon was obtained 349.8 and 435 mg/g, respectively. Results of Scanning Electron Microscope (SEM) images of nano activated carbon showed particle size pf less than 100 nm. Furthermore, Transmission Electron Microscope (TEM) pictures showed particle size of 30 nm. XRD images also showed cube structure of nano activated carbon adsorbent.

Conclusion: The results showed that adsorption capacity at constant humidity increased by raising in temperature and contact time. What is more, nano activated carbon adsorbent showed greater absorption capacity for xylene removal compared to activated carbon adsorbent.

Key words: Xylene, Adsorption, Nano Activated Carbon, Activated Carbon

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