Adsorption isotherms of VOCs(Ammonia, Acetaldehyde, Formaldehyde, Toluene) on composite activated carbon and surface modified zeolite

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Volatile organic compounds (VOCs) are the essential element of indoor air pollution. Removal of volatile organic compounds (VOCs) from emission streams is of considerable interest due to the harmful effects of these pollutants, even at very low concentrations.
In this study, the adsorption isotherms and breakthrough curves of VOCs on composite activated carbon and surface modified zeolite were obtained by measuring. Also, The breakthrough experiment was conducted at 15, 25 degrees and 8, 10ppm.
To measure VOC adsorption isotherms and kinetics, we used handmade volumetric measurement device. Equilibrium experiments were conducted at 293K and pressure up to 0.1 MPa.
Adsorption results were applied to exist adsorption isotherm models (i.e. Langmuir, Sips etc) to determine each parameter. The validity of the previous results was also evaluated by using the conventional method. Based on the results, the relative effectiveness of the effect of adsorbent and VOC properties on the VOC removal efficiencies are analyzed.