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A study on gas adsorption using surface-modified porous carbon composite materials**Jihyun Bae, Seongho Choi, Seungho Lee and Woonjung Kim**
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Attention of Volatile Organic Compounds (VOC), which are generated by air pollution such as fine dust because of the rapid increase of automobiles and the consumption of oil and organic solvents are increasing. In particular, the aromatic compounds (e.g., benzene) can cause serious harm to the body's immune system and must be removed prior to release. Types of VOC removal using catalysts include transition metal oxidation catalysts, TiO₂ photocatalysts and complex catalysts comprising TiO₂ and activated carbon. In the case of the removal of VOC using catalyst, new byproducts are generated due to the catalytic reaction and the possibility of secondary pollution sources is very high. In this study, a porous carbon composite material was prepared for the purpose of replacing catalyst type (TiO₂). In order to solve the limitation of adsorption removal of VOC pollutants with various molecular weights and morphologies, we studied a framework to manufacture porous carbon composite materials with various sizes of pores on controlling the porous nano-size through surface modification. As a result, the gas adsorption amount was seven times higher in the cylindrical shape than in the spherical shape. Also, the adsorption amount of the gas increased as the concentration of the diazonium salt increased on the surface of the carbon composite material. It is possible to control the pore conditions according to the shape and surface modification conditions of the carbon composite material and to propose a new method of increasing the adsorption capacity of the gas by maximizing the surface area.

Biography

Jihyun Bae has earned his undergraduate degree in Chemistry at Hannam University, Republic of Korea in 2017. Presently he is a graduate student of Chemistry at the same university.

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