

## Sick house syndrome induced gas adsorption characteristic of oxygen plasma-treated activated carbon fibers

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In this study, oxygen functional groups were introduced on the surface of the activated carbon fibers (ACFs) by oxygen plasma treatment to improve adsorption performance of ACFs on acetic acid gas which is a sick house syndrome induced gas. As flow rate of oxygen gas injected during oxygen plasma treatment increased, physical and chemical etching occurred due to generated oxygen plasma active species, and the specific surface area of the ACF decreased. In particular, the specific surface area of the sample (A-O60) injected with an oxygen gas flow rate of 60 sccm was reduced to 1198 m<sup>2</sup>/g, which was about 6.95% lower than that of the untreated sample. On the other hand, as flow rate of oxygen gas injected during oxygen plasma treatment increased, oxygen functional groups introduced on the surface of the ACFs tended to increase and it was confirmed that the maximum of 35.87% was introduced. In addition, the removal efficiency about 100 ppm of acetic acid gas in oxygen plasma treated ACFs was improved by 43% compared to the untreated ACFs. From these results, it was confirmed that oxygen plasma treatment can be applied to the surface treatment method for removing effective acetic acid gas of ACFs.

**Key words:** Oxygen plasma; Acetic acid; Activated carbon fibers; Gas adsorption