

Dynamic adsorption of H₂S by KI impregnated activated carbon in fixed bed columns

최도영, 장성철, 공경택, 안병성, 최대기*
한국과학기술연구원
(dkchoi@kist.re.kr*)

Anaerobic digestion gases (ADG) consist primarily of methane and carbon dioxide, plus trace amounts of sulfides, organic halides and non-methane hydrocarbons. The specific contaminants in the ADG of concern to the fuel cell are sulfur and halides. Both of these ingredients can poison and therefore reduce the life of the power plant's fuel processor. The catalyst in this bed can react with the halides and sulfides and lose its activity. The KI impregnated activated carbons were used for adsorption catalytic removal of hydrogen sulfide from anaerobic digester gas. The dynamic removal of hydrogen sulfide by KI impregnated activated carbon was studied in packed bed columns. The values of column parameters were predicted as a function of oxygen concentration and relative humidity. Various contents of oxygen concentration and relative humidity have significant effect on the performance of the materials. To predict the breakthrough curves and to determine the characteristic parameters of the column useful for process design, kinetic model were applied to experimental data.