

Dynamic simulation of hydrogen sulfide adsorption in a packed bed column of activated carbon

Abstract

Petroleum has been a major energy source to our human being in operating machines and in other usages. The high profitable petroleum is important in our daily life but before acquiring the useful products, there are also impurities such as hydrogen sulfide which is available in the crude oil that must be removed to avoid any hazard that could bring to the environment and human health. In oil refinery industry, hydrogen sulfide is commonly removed through water stripper but very little data is available on the removal of hydrogen sulfide using adsorption process. Thus, in this study, **simulation modeling** of adsorption of hydrogen sulfide onto activated carbon was carried out by providing respective adsorption isotherm, adsorption kinetic, mass balance and kinetic modeling. Under isothermal conditions with no pressure drop and constant velocity, the simulation had been conducted to justify the feasibility of the data provided by the industry after optimizing the size of adsorption bed that should be used. Most of the parameters should be assumed with a reasonable value in order to continue with the simulation. As a result, the actual data provided by the industry shows the feasibility of the size of adsorption bed after optimization due to the high flow rate and high hydrogen sulfide concentration.