

Development of K_2CO_3 -based dry sorbents using SnO_2 and $LiAlO_2$ for post-combustion CO_2 capture

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Gamma alumina (γ - Al_2O_3) is commonly used as a support or an additive material to design the ideal alkali metal-based sorbent. However, potassium-based sorbent using γ - Al_2O_3 was deactivated due to the formation of by-product such as $KAl(CO_3)(OH)_2$ during CO_2 sorption. To overcome this problem, development of novel potassium-based sorbent is required using new supports or additive materials instead of γ - Al_2O_3 . In this study, potassium-based dry sorbents using new supports or additive materials such as SnO_2 and $LiAlO_2$ were developed and investigated at a low temperature range between $60^\circ C$ and $200^\circ C$. And the structure changes of the potassium-based sorbents were investigated by power X-ray diffraction. These sorbents show high CO_2 capture capacities (89–94mg CO_2/g sorbent). In addition, these high CO_2 capture capacities are maintained during multiple cycles even at a low regeneration temperature of $200^\circ C$.