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Addition/Correction

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Correction to "Use of Nanoporous FeOOH as a Catalytic Support for $NaHCO_3$ Decomposition Aimed at Reduction of Energy Requirement of $Na_2CO_3/NaHCO_3$ Based CO_2 Separation Technology"

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The activation energy for the decomposition of pure $NaHCO_3$ was incorrectly reported in the abstract of the original article as 80 kJ/mol. The correct value is 86 kJ/mol. The complete, corrected abstract should read as:

CO_2 capture is typically a costly operation, usually due to the energy required for regeneration of the capture medium. Na_2CO_3 is one potential capture medium with the potential to decrease this energy requirement. Extensively researched as a potential sorbent for CO_2, Na_2CO_3 is well-known for its theoretically low energy requirement, due largely to its relatively low heat of reaction compared to other capture technologies. Its primary pitfalls, however, are its extremely low reaction rate during sorption and slow regeneration of Na_2CO_3. Before Na_2CO_3 can be used as a CO_2 sorbent, then, it is critical to increase its reaction rate. In order to do so, this project studied nanoporous FeOOH as a potential supporting material for Na_2CO_3. Because regeneration of the sorbent is the most energy-intensive step when using Na_2CO_3 for CO_2 sorption, this project focused on the decomposition of $NaHCO_3$, which is equivalent to CO_2 desorption. Using BET, FTIR, XRD, XPS, SEM, TEM, magnetic susceptibility tests, and Mössbauer spectroscopy, we show FeOOH to be thermally stable both with and without the presence of $NaHCO_3$ at temperatures necessary for sorption and regeneration, up to about 200 °C. More significantly, we observe that FeOOH not only increases the surface area of $NaHCO_3$ but also has a catalytic effect on the decomposition of $NaHCO_3$, reducing activation energy from 86 to 44 kJ/mol. This reduction in activation energy leads to a significant increase in the reaction rate by a factor of nearly 50, which could translate into a substantial decrease in the cost of using Na_2CO_3 for CO_2 capture.

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