Carbon Dioxide Conversion to Hydrocarbon Fuel Utilizing Metal Catalyst

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Carbon dioxide is one of the most discussed atmospheric gases due to its greenhouse effect on global climate. It is well known to trap the sun's thermal radiation and raise the temperature of earth’s atmosphere. There are many conversations about how to reduce the production of carbon dioxide. However, just trying to reduce the future emission will not solve the problem caused by the existing CO2 already in the air. Unfortunately, there is very little discussion about what to do with the existing carbon dioxide currently present in the atmosphere. Carbon dioxide was converted to hydrocarbon fuel utilizing metal catalyst mixture in a tube furnace. Several transition metals, such as iron, copper, lithium, zinc, manganese that were in nitrates and carbonates form were mixed with alkali metal nitrates and carbonates on a hot plate to prepare the metal catalyst. This was then heated between 200 - 400 degrees Celcius with CO2 and H2 mixed together in the tube furnace to produce hydrocarbon. Gas Chromatography Mass Spectrometry (GC-MS) analysis was performed to confirm the converted gas product was hydrocarbon. This hydrocarbon can be reused as an energy source or transportation fuel. Converting carbon dioxide to reusable hydrocarbon fuel feasability was successfully demonstrated by using metal catalysts at relatively low temperature. This process has the possibility of being used in ships and automobiles to capture CO2 emissions and converting a portion of it back to hydrocarbon fuel and help mitigating climate change by not adding large amounts of greenhouse gas in the atmosphere.

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