Seeing the positive side of carbon dioxide

1 March 2013

Research at Bath has developed a more efficient way of converting CO2 into useful chemical products.

(Phys.org)—New research from Bath has explored the idea of treating carbon dioxide as a useful product rather than waste, by capturing it and converting it into useful chemicals and reducing the quantity of this greenhouse gas in our atmosphere.

Carbon capture and storage is promoted as one of the most promising solutions to global warming, but the Bath research team now want to take that locked-away carbon dioxide and realise its potential as a large-scale and free alternative to fossil fuels.

In recent years, as oil prices have risen and governments have become environmentally concerned, the well-documented 1920s Fischer-Tropsch process for the conversion of carbon monoxide and carbon dioxide has been explored by researchers around the world.

However to date the processes used to create the catalysts needed to convert carbon dioxide have been energy intensive and therefore costly, and not suitable for use on a large scale.

Dr Davide Mattia, project lead from the University's Department of Chemical Engineering, said: "To date, methods have typically required the use of one catalyst to create the carbon support for the conversion process. Then the first catalyst has to be flushed out, and replaced with the second catalyst for the Fischer-Tropsch process. This is time and energy intensive, so makes the whole method expensive."

Dr Matthew Jones, co-author of the paper from the Department of Chemistry, added: "Our method is considerably more simple. We use the same catalyst at both stages, which means energy and time isn't required to purify the carbon support and the process can take place far more quickly.

"This makes our process scaleable to a level where it could be used in industry and have a significant impact on the environment."

The new method developed by the research team at Bath has been shown to work with both carbon dioxide and carbon monoxide, and tests have found it to result in a more effective catalyst than previous alternatives.

Looking to the future, the team hopes to explore the use of waste heat from power plants to run the process. Dr Mattia said: "By using waste heat we can further reduce the energy required by our method, and in the future it could even become carbon neutral."

The full research paper can be accessed via the RSC website.

Provided by University of Bath