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AIRCRAFT FUEL MADE FROM CARBON DIOXIDE

The method for producing jet fuel using carbon dioxide as the main component has been proposed by a group of researchers from the UK and Saudi Arabia. Scientists discussed the issue in the journal "Nature Communications".

Engineers searching ways to lower carbon dioxide emissions are increasingly focusing on the most promising industries. One of them is aviation, which accounts for about 12% of the CO2 generated by transport.

Since reducing aviation CO2 emissions by electrifying aircraft is challenging due to the complexity of equipping aircraft with heavy batteries, the research team has developed technologies to maximize the environmental friendliness of jet fuel and standard liquid fuel for jet aircraft engines.

The researchers used a process known as high-temperature self-propagating fusion to convert carbon dioxide into a liquid jet fuel. It consists in heating up to 350 C in a special reactor made of hydrogen, carbon dioxide and citric acid in the presence of an iron catalyst containing potassium and manganese.

The interaction of these substances leads to separation of the carbon atoms from oxygen in CO2 molecules and, by binding with hydrogen, they are converted into hydrocarbon molecules that make up aviation kerosene. This produces water, ethylene, propylene and other substances. Testing showed that over 20 hours, the process converted 38% of the carbon dioxide in a pressurized chamber into jet fuel

and other products. The jet fuel made up 48% of the produced products—the others were water, propylene and ethylene. The researchers also note that using this fuel in aircraft would be carbon-neutral because burning it would release the same amount of carbon dioxide that was used to make it.

Scientists argue that the process they developed is cheaper than other methods of producing aircraft fuel, such as the use of water and hydrogen, mainly due to the lower energy consumption. Systems that use the new technology can be installed in factories that produce plenty carbon dioxide, such as thermal power plants.