Crystal that turns air to fuel will fight global warming

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A “spongy” crystal that can turn thin air into fuel by extracting carbon dioxide has been developed by scientists.

The researcher said the light-activated material was a “critical step” towards making a high-value fuel while at the same time reducing the amount of the greenhouse gas in the atmosphere.

It works by turning carbon dioxide into carbon monoxide, which can be turned into a useful source of

energy.

There is increasing concern that the world will not be able to restrict global warming to 1.5 degrees Celsius – the target set out in the Paris Agreement on climate change to avoid the more dangerous effects.

This has prompted scientists around the world to try to develop cost-effective ways of removing carbon from the atmosphere.

Professor Haimei Zheng, of the US Energy Department and University of California, Berkeley, and one of the researchers behind the new material, said: “The world right now is in need of innovative ways to create alternatives to fossil fuels, and to stem the levels of excessive carbon dioxide in the atmosphere.

“Converting carbon dioxide to fuels using solar energy is a global research endeavour. The spongy nickelorganic photocatalyst we demonstrated here is a critical step toward practical production of

high-value multi-carbon fuels using solar energy."

She said their technique produced almost 100 per cent pure carbon monoxide, with no other gases like hydrogen and methane detected. "That's a big deal. In carbon dioxide reduction, you want to come away with one product, not a mix of different things. Complete suppression of the competing hydrogen evolution during a photocatalytic carbon-dioxide-to-carbon-monoxide conversion had not been achieved before our work."

The nickel-organic photocatalyst used in the process is said to have similar properties to metal-organic frameworks, or MOFs, which have been hailed as potential wonder materials.

MOFs are a sophisticated blend of metal and carbon capable of soaking up poisonous gases, creating water from the driest of air, and storing the next generation of hydrogen fuel.

The research was described in a paper in the journal Science Advances.