

Diamond Particles Found in Candle Flames, Scottish Scientists Say

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Candle flames contain millions of tiny diamond particles, Scottish scientists said Thursday.

Researchers successfully removed particles from the center of a candle flame for the first time and found that around 1.5 million diamond nanoparticles are created in the flame every second.

Dr. Wuzong Zhou, from the University of St. Andrews, in eastern Scotland, embarked on the study after a challenge from a fellow academic.

"A colleague at another university said to me, 'Of course no one knows what a candle flame is actually made of.' I told him I believed science could explain everything eventually, so I decided to find out," he said.

Using a new sampling technique, Zhou and his PhD student Zixue Su successfully removed particles from the center of the flame and found that it contained all four forms of pure carbon.

"This was a surprise because each form is usually created under different conditions," Zhou said.

Since the first candle was invented in China more than 2,000 years ago, studies have shown that hydrocarbon molecules



are burned at the bottom of the flame and carbon dioxide released at the top — but what happened during the process in between had remained a mystery until now.

As well as diamond nanoparticles at the center of the flame, the researchers also discovered fullerenic particles, along with graphitic and amorphous carbon.

"Unfortunately, the diamond particles are burned away in the process," Zhou said. "But this will change the way we view a candle flame forever."

It is hoped that the discovery could lead to research into how diamonds could be produced more cheaply. ■