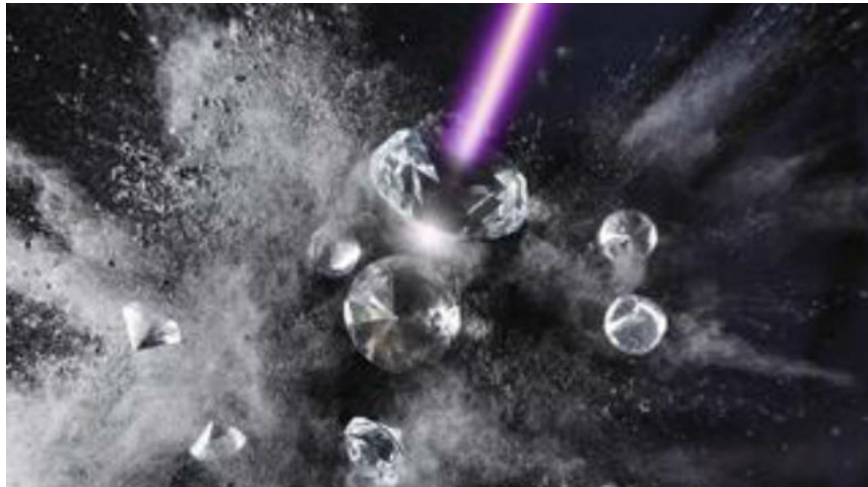


Research shows that: X-rays can turn diamond into graphite

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Scientists have for the first time turned diamond into graphite by using ultra-short ultraviolet rays of X-rays. This is a crucial step in understanding the basic behavior of solids when they are absorbed. radiation energy. For the first time, researchers including Franz Tavella from the SLAC National Accelerator Laboratory in the US were able to track the resolution process over time of this process.



Tavella, the first author of this study, published in the Journal of High Density Energy Physics, said: " *In addition to these fundamental aspects, understanding of the process of making graphite is important for needle technologies. Diamonds, because diamonds are increasingly used in practice Diamonds and graphite are different forms of carbon. Diamonds are formed under high pressure from deep in the earth. "*

Under normal conditions, diamonds are extremely durable, meaning that it converts back to graphite when the process is started with a sufficiently large energy source. There are many different ways to activate diamond to graphite conversion, for example by simply heating the diamond under the elimination of oxygen or even for action under the conditions of chemical catalysis and physical mechanics, researchers said.

They said that with high heat and pressure, graphite could be converted into synthetic diamonds and they were pretty much available in the worldwide market.

The team used Italy's free X-ray laser FERMI to shoot ultra-short rays in small diamond pieces with a thickness of only 0.3mm. "Normally, if you fire strong laser pulses on ordinary solid objects, it will become amorphous. But diamond is another example, "the researchers said. It could convert its internal structure to another order,

thus turning into graphite.

"In principle, people know that if you release enough energy into a diamond, it will switch to amorphous state ' .
- Mr. Sven Toileikis from the German national research center DESY said.

This conversion process involves a thermal transition, in which the absorbed energy is transferred to the crystal network inside the diamond, which is transferred enough energy until the diamond is converted into the graphite structure. .

The researchers say another method is a method that does not use temperature, in which energy absorbs only a small fraction of electrons in a diamond, changes the inner energy surface, causing a crystal mesh rearrangement. Beata Ziaja from DESY said. *"The process of non-thermal conversion is much faster than that of heat, this time occurs in picoseconds, a picosecond is a trillionth of a second"*.

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