Unlocking the organic composition of ancient asteroids

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New technology discovers primitive organic matter in 4.5 billion year old meteorites

Meteorites contain fragments of asteroids brought about by collisions within the asteroid belt. These meteorites have not been exposed to geological processes experienced by planets and stars. Therefore, much of the matter in these meteorites originates from the formation of the Solar System some 4.5 billion years ago.

Being the only record of the Solar System's pre-biotic chemical evolution, scientists have tried for years to extract and study this material. It is believed that discovering the composition of meteorites will reveal what the Solar System was made of at its birth and how those materials evolved into our current-day universe.

Most of the methods used to extract this matter have failed leading to the destruction of the meteorite material or just the inability to extract any compounds.

However, a recent study from the Planetary and Space Science Journal explains how scientists have developed a novel approach to extracting these meteoric materials. It's called hydropyrolysis.

This new technology uses high hydrogen gas pressures, extreme temperature, and water as a non-destructive means for extracting organic and inorganic compounds from meteorites.

This process has revealed high amounts of carbon and nitrogen- elements essential to life at the core of the meteorites. Also, this new technology revealed several never-before-seen organic molecules.

The results of this study also contradict a common understanding to the origin of meteorites. It is thought that meteoric material originated from a molecular could that collapsed to form the Solar System. Scientists using hydropyrolysis believe this is a misconception and seek to use this technology to find the true origin of the organic matter in meteorites.

Scientists hope that the use of this new technology will offer even more clues into the composition of the Solar System when it was forming.

Finally researchers have a way to trace the evolutionary path of organic compounds which will ultimately lead to knowledge of the evolution of our universe.

Reference:

Sephton M, Love G, Meredith W, Snape C, Sun C, and Watson J. 2005. *Planetary and Space Science Journal*. Article in Press.

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