

## News & Comments

# Martian Formation Sequence Flipped as per the new theory

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Scientists believe the Chassigny meteorite, which fell in northeastern France in 1815, originated from the inside of Mars because it contains gases different from those in the current Martian atmosphere. Venus, Earth, and Mars were formed as rocky planets, according to a new [study](#) of an old meteorite. New findings have implications for the composition of the early atmosphere of the Red Planet.

Earth and Mars are thought to have acquired volatile chemical elements like hydrogen, carbon, oxygen, nitrogen, and krypton during the early stages of their formation from the gaseous nebula surrounding their parent star. At this point, the planet is a molten ball of rock, with the elements dissolving in a magma ocean, then degassing. As a result, more volatile materials are delivered to the planet by chondritic meteors impacting it. Consequently, a planet's interior should reflect the solar nebula's composition, while its atmosphere should reflect meteorite vapors.

The ratios of noble gases, especially krypton, can be used to distinguish between these two sources. The rapid formation and solidification of Mars, which took about 4 million years as compared to Earth's 100 million years, provides information about the very early stages of planetary formation. That is when the Chassigny meteorite comes in handy. Although Krypton is difficult to calculate, a team of scientists employed a new technique using the UC Davis Noble Gas Laboratory, to measure krypton in the Chassigny meteorite.

The findings suggest that the krypton isotope ratios in the meteorite are closer to those associated with chondrites. Meteorites may have delivered volatiles to Mars much earlier than previously thought before the solar nebula dissipated. So after Mars' global magma ocean cooled, it would acquire the first atmosphere from the solar nebula; otherwise, there would be a great deal more mixing between the chondritic and nebular gasses than what the team observed.

There are many interesting questions raised by the study about the origin and composition of Mars' early atmosphere, even as it points to the presence of chondritic gasses in its interior.

### KEYWORDS

krypton, Mars, meteors & meteorites, noble gases, planetary evolution, Planetary interiors, solar system, Space & Planets, mysteries

