

Impact-devolatilization from carbonates: direct measurements of volatiles using a Laser gun

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During a hypervelocity impact event, the temperatures and pressures near the impact site becomes extremely high and the volatile in the rocks are released as gas. This is called impact-devolatilization and played important roles on the evolution and history of the Earth and planets. Especially, it is believed that impact-devolatilization affects the formation of the atmosphere and evolution of the surface environment of terrestrial planets.

However, the chemical composition of the released gas during an impact has not been measured directly. This is because of experimental difficulties such as soot and gun debris. Thus, in this study, we carried out impact-devolatilization experiments using a laser gun to avoid such problems. A laser gun does not generate soot and gun debris and we can analyze released gas accurately and directly using a quadrupole mass spectrometer. In this talk, we report the results of the impact-devolatilization experiments from calcite.