

Abstract Submitted
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**Understanding the Martian Atmosphere-Geosphere Interactions
Using Oxygen Isotopic Forensics** ANI KHACHATRYAN, MARK THIEMENS,
ANALISA HILL, ROBINA SHAHEEN, KENNETH CHONG, University of California
San Diego, THIEMENS RESEARCH GROUP -STABLE ISOTOPE LABORATORY
TEAM — Recent missions to Mars have shown that the planet might have
hosted liquid water based on the morphological characteristics of its lithosphere. In-
formation about the evolution of Martian surface and atmosphere is obtained via the
study of Martian meteorites. Unlike Earth, Martian geosphere does not appear to
be well mixed and bulk silicates show a range of oxygen isotope anomalies from 0.3
to 0.6 ‰. In order to understand this anomaly an experiment was designed with
Mars simulant, liquid water and ozone to reproduce the unique $\Delta^{17}\text{O}$ isotopic value
uniquely characteristic of Martian meteorites. This quantity is used as a tracer of
the reaction pathways occurring on the surface of Mars. We believe that only in the
presence of these three ingredients can the specific value be achieved. By simulat-
ing the chemical processes occurring on the surface of Mars, we seek to understand
the interactions of Martian hydrosphere, atmosphere and geosphere. This study is
unique for the advancement of cutting edge research in the evolution of planetary
atmosphere and surfaces, and the search for liquid water. The oxygen triple isotopic
analysis is a tool that provides us with clues for discovering the geochemical history
of the red planet.

Ani Khachatryan
University of California San Diego

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