Goldschmidt 2024 Abstract
https://doi.org/10.46247/gold2024.22195

Chemical Processes under Extreme Conditions

JOHN TSE[1], HUIYAO KUANG[1] AND ALEXANDER GONCHAROV[2]

[1]University of Saskatchewan
[2]Carnegie Institution for Science
Presenting Author: john.tse@usask.ca

High pressure and temperature can significantly alter the electronic structure of a material. Chemical processes under these conditions may not be easily predicted or rationalized with conventional and intuitive chemical principles. In this study, we explore the reaction of H_2 and H_2O on several representative minerals over a broad pressure and temperature range, in the solid and molten state. The results unveil diverse chemical interactions and reaction products. An example is the observation on the formation of “diamondiods” coexist with molecular water was found in the simulation of the reaction of H_2 with $CaCO_3$. Subsequent experiment validation this prediction.