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### **Earth's Magma Ocean volcanic outgassing**

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During the early phase of its evolution, the Earth was likely characterized by a magma ocean stage [1]. The aim of this research is to improve the present knowledge about the interactions between the magma ocean degassing and the related growing of the early Earth's atmosphere. Specifically, the volcanic degassing of volatile using petrological software tools and numerical modelling of the atmophile volatile release [2,3,4,5] is under investigation. We have been analysing the volatile transition from the mantle to the atmosphere of the C-O-H system. Considering the oxygen fugacity as one of the main factors that affects the chemical speciation, we observed changes in the ratio of reduced (H<sub>2</sub>, CO, CH<sub>4</sub>) or oxidized (H<sub>2</sub>O and CO<sub>2</sub>) species with different  $fO_2$  values. In the next stage of the research, it is also planned to investigate the role of the halogens (Cl and F) and of the sulfur species by conducting related petrological experiments in collaboration with the University of Münster.

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Cite abstract as:

Ortenzi, G., Sohl, F. (2017) Earth's Magma Ocean volcanic outgassing. Paneth Kolloquium, Nördlingen (Germany), abstract URL: <http://www.paneth.eu/PanethKolloquium/2017/0087.pdf> (abstract #0087).