

Open PhD position in Biogeochemistry

'Iron catalyzed formation of methyl radicals as a common source of environmentally important volatile organic compounds'

Organic and inorganic volatile compounds containing one carbon atom (C₁), such as carbon dioxide, methane, methanol, formaldehyde, carbon monoxide and chloromethane are ubiquitous in the environment and play an important role in atmospheric physics and chemistry as they act as greenhouse gases, destroy stratospheric and tropospheric ozone and control the atmospheric oxidation capacity. Furthermore, these compounds play an important role in global carbon cycling. So far, it has not been recognized that many C₁ compounds in the geobiosphere might also have a common origin in methyl groups from methyl-substituted substrates that are cleaved by the iron-catalyzed formation of methyl radicals.

We are seeking a PhD student to investigate the role of iron-catalyzed formation of methyl radicals subsequently leading to C₁ compounds. The candidate will systematically investigate the formation of C₁ compounds in the laboratory, using different iron species and biogeochemically relevant methyl-substituted substrates and applying state of the art analytical measurements including stable isotope techniques. Furthermore, to thoroughly understand the chemistry behind these processes, we will identify the mechanistic steps of methyl radical and C₁ formation and verify mechanistic scenarios using computational modeling (this will be mainly done in cooperation with a PostDoc from the chemistry department). Finally, the candidate should put the assembled knowledge into practice and study these reactions in water and soil samples collected from the field.

The candidate will be given many opportunities to be creative and innovative, to apply state-of-the-art analytical analyses (GC-MS, GC-FID, GC-IRMS) in the field of biogeochemistry, and to work on a challenging, interdisciplinary and highly relevant topic.

Start date for successful applicants is fall/winter 2020. Employment (TVL E13, 65%, 3 years) will be arranged by the University of Heidelberg. The university seeks to raise the number of women in research and teaching and therefore urges qualified women to apply. Disabled persons will be preferred in case of equal qualification.

Requirements:

- Strong background and/or interest in Analytical Chemistry, Biogeochemistry, Geochemistry and Earth Sciences
- Ability to work independently and in a team
- Excellent management and communication skills
- Highly motivated for interdisciplinary research
- Good computer and language (English) skills
- Experience in the application of the abovementioned analytical techniques is an advantage

For more information and to apply, please send a CV, motivation letter and overview of techniques and methods previously used by email before **October 25th, 2020** to: Prof. Dr. Frank Keppler (frank.keppler@geow.uni-heidelberg.de) Biogeochemistry Group, Institute of Earth Sciences, University of Heidelberg, Germany. <https://www.uni-heidelberg.de/fakultaeten/chemgeo/geow/researchgroups/keppler/index.html>