



The BRACE CENTRE FOR WATER RESOURCES MANAGEMENT

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EXPLORING THE POTENTIAL OF IRON-BEARING CLAY MINERALS FOR SUSTAINABLE CONTAMINANT REMEDIATION AND WATER TREATMENT SYSTEMS

Clay minerals play an important role in the fate of organic and organic contaminants. In addition to contaminant sorption, clay minerals also contribute to contaminant transformation, for example of organic contaminants such as nitroaromatic compounds or halogenated hydrocarbons, in the presence of structural Fe(II) in clay minerals. We have shown that aqueous Fe(II), an abundant reductant in anoxic environments, is capable of transferring electrons to structural Fe in clay minerals, resulting in the formation of clay mineral Fe(II) and an Fe(III) oxidation product. This seminar will explore our recent work on contaminant reduction with Fe(II)-reduced clay minerals, compare the involved processes to those of chemically and microbially reduced clay minerals, and examine the potential of Fe-bearing clay minerals to serve as a source of renewable redox equivalents for sustainable contaminant remediation. In the second part of the seminar, I will present our current findings on contaminant oxidation in the presence of Fe(II)-bearing clay minerals. In this research theme, we investigate the formation of reactive oxidizing species from the reaction of clay mineral Fe(II) with oxygen for the design of a novel advanced oxidation process for water treatment.

Anke Neumann received her PhD from ETH Zurich where she worked on redox reactions of Fe-bearing clay minerals, and then pursued postdoctoral research in Bangladesh, where she studied how Fe redox reactions can be exploited to clean drinking water in arsenic removal filters. For this work, Anke collaborated with researchers from Bangladesh, Switzerland (Eawag), and the USA (George Mason University). She then moved to the University of Iowa for a postdoctoral project. In 2014, she joined the Environmental Engineering Group at Newcastle University as a lecturer, where she continues to work at the interface of environmental engineering, mineralogy, and (bio)geochemistry.

Thursday, June 8th, 2017

McGill Downtown Campus, Macdonald Engineering Building, Room 497
3:30 pm - 4:30 pm

EVERYONE WELCOME