

Review

Aqueous contaminant removal by metallic iron: Is the paradigm shifting?

C Noubactep*

*Angewandte Geologie, Universität Göttingen, Goldschmidtstraße 3, D - 37077 Göttingen, Germany;
Kultur und Nachhaltige Entwicklung CDD e.V., Postfach 1502, D - 37005 Göttingen, Germany*

Abstract

Chemical reduction has long dominated thinking about the mechanism of aqueous contaminant removal in the presence of metallic iron (e.g. $\text{Fe}^0/\text{H}_2\text{O}$ systems). However, a large body of experimental evidence indicates that chemical reduction is not adequate to satisfactorily explain the efficiency of $\text{Fe}^0/\text{H}_2\text{O}$ systems for several substances or classes of substances. By contrast, the alternative approach, that contaminants are fundamentally adsorbed and co-precipitated by iron corrosion products seems to provide a better explanation of observed efficiency. The new approach appears to not be fully understood. The present communication aims at clarifying this key issue. It seems that a paradigm shift is necessary for the further development of the technology using Fe^0 for water treatment.

Keywords: contaminant removal, paradigm shift, removal mechanism, water treatment, zero-valent iron