Technical Article - Mine water and the environment

Capacity of Wood Ash Filters to Remove Iron from Acid Mine Drainage: Assessment of Retention Mechanism

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Online Resource 4. Iron and sulphate Eh-pH diagram

Online Resource Fig. 3 a and b show the Eh-pH stability diagram of iron and sulfate for columns 1, 2, and 3. Eh-pH conditions varied during the experiment: pH tended to decrease and Eh to increase. However, their variation does not impact the stability of the iron and sulfate phases. Goethite was the stable form of iron during most of the experimental period. Pyrite was not stable, even at the beginning of the experiment when the redox potential was low. Gypsum, though, was stable throughout the experimental period. According to this predicted geochemical behaviour of iron and sulphate, saturation of materials and the breakthrough cannot be attributed to geochemical changes inducing precipitation of other minerals. Saturation of material was linked to sorption site saturation.
Online Resource Fig. 3. a) Iron Eh-pH diagram and b) sulphate Eh-pH diagram