Birnessite formation and its transformation in acid media

GEOC 47

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Birnessite formed in acid media has a similar hexagonal structure to biogenic manganese oxide. The formation of acid birnessite and its transformation through redox reactions involving MnO_4^{2-} and concentrated HCl in boiling solution were investigated by XRD, XAFS and TEM. The results show that the long range structure of acid birnessite produced in varying HCl concentrations is similar to each other. However, their local structures, such as amount of vacancy sites, composition and Mn oxidation state, are different. With increasing HCl concentration or reaction time, the average oxidation state of Mn, the molar ratio of K/Mn and the amount of vacancy sites in the acid birnessites decreased. Acid birnessite was gradually converted to pure 2×2 tunnel structured cryptomelane in the higher HCl concentration solution.

General Geochemistry Posters
6:00 PM-8:00 PM, Tuesday, August 19, 2008 Pennsylvania Convention Center -- Hall C, Poster

Sci-Mix
8:00 PM-10:00 PM, Monday, August 18, 2008 Pennsylvania Convention Center -- Hall C, Sci-Mix

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