Geophysical Research Abstracts
Vol. 14, EGU2012-11285, 2012
EGU General Assembly 2012

Biogeochemistry on the Interrelation between AMD and Sediments under Seasonal Variations

K. H Cho (1), B. J Kim (1), D. W Wi (1), N. C Choi (2), and C. Y Park (1)

(1) Energy and Resource Engineering, Chosun Univ, Republic Of Korea (kanghee1226@hanmail.net), (2) Engineering Research Institue, Chonnam National Univ, Republic Of Korea

The objective of this study was to investigate the influence of the seasonal characteristic variations on heavy metals through geochemical property on the interrelation between acid mine drainage (AMD) and sediments in the abandoned Hwa-sun coal mine, Korea. We conducted to confirm the chemical and mineralogical property (XRD, SEM-EDS and IR) using AMD and sediments samples (per month). As high concentrations in AMD and sediments were showed a large variability from 168.12 to 2,500.12 mg/L and 5.25 ∼179g/kg, respectively. Also Fe contents measured from 20.46 to 280.63 mg/L in AMD and 13.72 ∼56.84 weight percents in sediments. Compared to effective precipitation, As and Fe content in AMD and sediments was appeared dry season was higher than rainy season. In XRD analyses of the sediments, x-ray diffracted d-value belong to Quartz, Ca-minerals (aragonite and calcite) and Fe-mineral (lepidocrocite) was observed. In the IR analysis, the OH-stretching vibration, the gamma-OH bending vibration and the delta-OH-bending vibration of diagnostic absorption bands for iron hydroxide were well found in the yellow-colored iron hydroxide. The results of SEM-EDS analysis revealed that Sheathed-filament and twist-stalk structures were observed in the amorphous iron-hydroxide. It is suggested that this is a microorganism that produces the iron-hydroxide. The EDS analysis detected Fe and As ions on the iron-hydroxide which were attached to the sheathed-filament and the twisted-stalk were detected.