Analysis of Rb-Sr isotopic mass spectrometer and dating for bauxite deposits in Shanxi Province

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Introduction

The Carboniferous bauxite deposites are diaspore bauxite deposites in Shanxi, China. Carboniferous bauxite in Shanxi massif is considered the combination of BED G bauxite and Shanxi-type iron deposit, which joint together and and are called Ferrallite Formation (Wang Y.*et al*., 2000).

Analytical Method

Analysis of Rb-Sr abundances and their isotope compositions were performed on an automated multi-channel mass spectrometer VG 354 at Center of Modern Analysis, Nanjing University. Isotope dilution method was used for determination of the abundances. All Sr isotopic data are corrected for mass fractionation to $^{86}Sr/^{88}Sr = 0.1194$ and reported relative to a value of $^{87}Sr/^{86}Sr = 0.710224\pm6$ (2σ) for NBS987 standard.

Discussion of Results

Isotopic age of the whole rock-mineral internal Rb-Sr isochron for Bauxite Clayrock from Wu Tai In Shanxi is 316.9±1.2 Ma and initial $^{87}Sr/^{86}Sr$ ratio is 0.71054±14; Isotope age of the whole rock-mineral internal Rb-Sr isochron for Bauxite Clayrock from Linxian In Shanxi is 315.5±1.3 Ma and initial $^{87}Sr/^{86}Sr$ ratio is 0.71086±18; Isotope age of the whole rock-mineral internal Rb-Sr isochron for Bauxite Clayrock from Xiaoyi In Shanxi is 317.3±1.1 Ma and initial $^{87}Sr/^{86}Sr$ ratio is 0.71050±14.

Conclusion

We have been obtained for the bauxite whole-rock and clay mineral samples from Wu Tai (RS01), Linxian. We have been obtained for the bauxite whole-rock and clay mineral samples from Wu Tai (RS01), Linxian (RS02) and Xiaoyi (RS03), Shanxi Province respectively. These ages indicate that bauxite and the ore-hosting sedimentary sequence in Shanxi were deposited in the time interval betweein 315-317 Ma, corresponding to the Late Carboniferous Epoch.

Reference

Wang Yinxi, *et al*. (2000). *Geological Journal of China University*. **6**:605-606

Chemical weathering in Yangtze River: Evidence from water chemistry and $\delta^{13}C$ of dissolved inorganic carbon

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Dissolved inorganic carbon (DIC) of river water from the mainstream and major tributaries of Yangtze River were measured with a main purpose to understand the chemical weathering. The equivalent ratios of $[Ca^{2+} + Mg^{2+}]/[HCO_3^- + SO_4^{2-}]$ of most samples are around unit, indicating a relatively large part of Ca^{2+} and Mg^{2+} need to be balanced by SO_4^{2-}, which may be from the gypsum dissolution and/or dissolution of carbonate minerals by H_2SO_4. Based on chemical budget and stoichiometry analyses, the estimation resulted in that carbonate weathering, on average, accounts for ~67%, and silicate weathering and evaporite dissolution for ~22% and ~11%, respectively.

The $\delta^{13}C_{DIC}$ values range from -8.9‰ to -3.4‰, which represents a mixture of DIC produced by the following weathering pathways: (i) carbonate weathering by carbonic acid (-8.5‰); (ii) silicate weathering by carbonic acid (-17‰); (iii) carbonate weathering by H_2SO_4 (0‰) derived from the oxidation of sulfide and/or anthropogenic SO_2 emission. A positive relationship exists between the SO_4^{2-} and the $\delta^{13}C_{DIC}$, which further supports the hypothesis that H_2SO_4 is primarily neutralized by carbonates.

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