Updates in the aerosol-climate model ECHAM5-HAM and their effects

K. ZHANG* AND J. FEICHTER

Max Planck Institute for Meteorology, Hamburg, 20146, Germany (*correspondence: kai.zhang@zmaw.de)

Faithful simulations of the aerosol effects on climate require a realistic representation of aerosol mass and number concentrations as well as the size distribution of aerosol particles. In this work we attempt to quantify changes in the simulated aerosol distribution caused by various updates in the parameterization schemes of the global aerosol-climate model ECHAM5-HAM.

Since its first version developed by Stier *et al*. [1], ECHAM5-HAM has gone through further developments. The modifications include (1) a new time integration scheme for the condensation of the sulfuric acid gas on existing particles (Kazil *et al*. 2009), (2) a new aerosol nucleation scheme which takes into account the charged nucleation caused by cosmic rays (Kazil *et al*. 2009) , (3) an updated water uptake scheme for calculating the hygroscopic growth of aerosol particles (O'Donnell, 2009), and (4) a parameterization scheme explicitly describing the conversion of aerosol particles to cloud nuclei. Our analysis reveals that all these new treatments have resulted in significant changes in the model results. The simulated aerosol number concentrations and size distributions have improved in many aspects. Examples will be shown in the presentation. The corresponding changes in the simulated climate forcing will also be discussed.

[1] Stier *et al.* 2005: The aerosol-climate model ECHAM5-HAM, *Atmos. Chem. Phys*. **5**, 1125-1156. [2] Kazil *et al.* 2009: Sulfate aerosol nucleation, primary emissions, and cloud radiative forcing in the aerosol-climate model ECHAM5-HAM. To be submitted. [3] O'Donnell, 2009: *Towards the assessment of the climate impact of organic aerosols*, PhD thesis, Univ. Hamburg. To be submitted.

Characteristics of hydrothermal alteration in the Shaxi Porphyry Cu-Au deposit, Anhui Province, China: Paragenesis and geochemical

L.J. ZHANG*, T.F. ZHOU, Y.FAN AND F.YUAN

School of Resources and Environment Engineering, Hefei University of Technology, P.R. China (*correspondence: zljzhang@163.com)

Shaxi porphyry Cu–Au deposit is located at the northwest of Lu (Lujiang)–Zong (Zongyang) volcanic basin, Anhui Province, China, is a large pophyry Cu–Au deposit. The main ore–bearing rock of the deposit is quartz diorite porphyry. Hydrothermal alteration zones are similar to those recognized as forming in porphyry Cu–Au deposits worldwide. Studyies of alteration mineral chemistry at Shaxi pophyry Cu–Au deposit have revealed some important informations that may assist exploration.

The major alteration minerals at Shaxi porphyry deposit are arranged in a complex series of zones passing away from the deposit–potassic alteration zone (K–feldspar,Biotite) , K–silicate and propylite overprint alteration zone (K–feldspar, biotite, epidote, chlorite)–quartz sericite alteration zone (quartz, sericite, pyrite)–propylite alteration zone (epidote, chlorite, carbonate) (from the inside to the outside). The Cu–Au mineralization occurs in the potassic alteration zone and K–silicate and propylite overprint alteration zone.

The alteration process has resulted in the decrease of ∑REE and increase of LREE/HREE. The differentiation of LREE to HREE of altered rock and the alteration index $100\times(K_2O+1000Rb)/(K_2O+1000Rb+CaO+100Sr)$ can be used as an indicator for Cu–Au mineralization at Shaxi porphyry deposit.

This research was supported by the National Natural Science Foundation of China (40672062, 4083042 and 40803015) and Major State Basic Research Development Program of China (2007CB411405).

[1] Bureau of Geology and Mineral Resources of Anhui Province. (1995) Special Publication.