

## Geochemical studies from several Cu-Au deposits, Anhui, East China

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### Introduction

Yangtze valley is one of the most important metallogenic region in Jurassic-Cretaceous period in East China, where more than 200 polymetallic Cu-Fe-Au, Mo, Zn, Pb, Ag deposits resident ([1-4]). According to Chang et al. [1] and Zhai et al. [2], the Eastern Yangtze Craton of central to eastern China is an important Fe-Cu metallogenic province, whose metallogenic belt was controlled by faults and aulacogens in the continental plate at the Early Yanshan Epoch (Jurassic).

### Methods and Results

Data of REE and parameters calculated from Shaxi, Anqing, Chuxian, Tongling and Luzong Cu-Au deposits are collected and calculated [5-8], trying to illustrate geochemical processing of these famous Cu-Au mineralization in Anhui. Results show that differences of REE distributions with these four types of Cu-Au mineralization, which confine the sources of REE and trace elements as well as the other mantle and transitional compatible elements. The results of both REE and trace element geochemical studies show that different sources of REE and trace elements have different origin, which may represent the different sources of Cu-Au origin in the deep crust and upper mantle environments. Our study shows that the material related to Cu-Au deposits may originate from subduction of the west Pacific plate to east China continent.

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## Iron biomineralization by neutrophilic nitrate-reducing iron-oxidizing bacteria

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The processes of Fe biomineralization induced by Fe(II) bio-oxidation at neutral pH under anoxic conditions remain poorly understood. We present here a spectro-microscopic study of the biominerals produced by the nitrate-reducing iron-oxidizing bacteria *Acidovorax sp.* strain BoFeN1 cultured in the presence of dissolved [1] or solid Fe(II). As characterized by bulk X-ray Absorption Spectroscopy (EXAFS), the final products of Fe(II) oxidation consisted of amorphous Fe(III)-phosphate. Transmission Electron Microscopy (TEM) and Scanning Transmission X-ray Microscopy (STXM) highlighted the progressive periplasmic encrustation of the cells by iron minerals, accompanied by an accumulation of protein moieties. Extracellular iron also precipitated in association with exo-polysaccharides. Solid Fe(II) (composing extracellular abiotic vivianite precipitates formed during medium preparation) was partly oxidized with a few day delay compared to dissolved Fe(II). This led to strong redox heterogeneities at the nano-scale within the sample. Direct or indirect mechanisms can be proposed to account for these observations. All these findings provide new information to further the understanding of molecular processes involved in iron biomineralization by anaerobic iron-oxidizing bacteria.

[1] Miot *et al.* (2009) *GCA*, **73**, 696-711.