Features of the pyrites in black shale series in Southern Anhui Province

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Black shale series in southern Anhui Province are located widely and belong to Lower Yangtze depression area, mainly developing the Sinian and Early-Middle Triassic sedimentary cover, late Yanshanian intrusions, and Indosinian-Early Yanshanian NE Jura-type folds and a series of the NE thrusting (sliding) nappe structure.

According to the crystal habit of the pyrite crystals in black shale series in southern Anhui Province, the pyrites can be divided into five crystal forms: {100} cube, {100}+{200} cube and pyritohedron combination, {111} octahedron, {210} pyritohedron and {210}+{111} pyritohedron and octahedron combination. The Co/Zn ratios of pyrites with various crystal forms are relatively low, mostly less than 0.15. The As content of the pyrite with {100} + {200} crystal form is the highest (120 ppm), and that of the pyrite with {111} crystal form is about 32 ppm on average that is many times higher than claystone's (6.6 ppm).

The Co/Zn ratios of sediments can distinguish their different sources. The Co/Zn ratio for hydrothermal origin is relative low, with value of 0.15 on average, and that in iron-manganese crust or concretion is about 2.5 in general. Therefore, the Co/Zn ratios can be used as a sensitive indicator to distinguish the source of sediments. The Co/Zn ratios of the pyrites from black shale series in southern Anhui Province suggests that the pyrites are derived from submarine hydrothermal fluid. As is an active element of hydrothermal fluid, so the As anomaly in sediments can be used as an indicator of submarine hydrothermal activity. The As values of the pyrites from black shale series in southern Anhui Province indicates that the pyrites have features of strong hydrothermal deposit.

Many studies suggest that hydrothermalism is the key for the formation of noble metal deposits in black shale series. This conclusion has been proved in Hunan-Guizhou. The pyrite's features and genesis indicate that the noble metals may enrich and even form deposit in black shale series in southern Anhui Province.

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Mineral paragenesis and textural features of gneisses and amphibolites from Daday-Devrekani (Kastamonu, Turkey) Massif: Preliminary results

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The Daday-Devrekani (Kastamonu, N Turkey) massif contains various metamorphic rocks ranging from Precambrian to Early Cretaceous in age [1]. NE part of the massif contains medium to high grade metamorphic rocks, called Devrekani Metamorphics [2], and divided into two sub-units; gneissic rocks of the lower parts and calcite marbles of the upper parts. In this study, gneissic and amphibolitic rocks of the massif were examined in terms of mineral assemblages and textural evidence of metamorphic P-T conditions. The gneissic rocks are biotite-hornblend, cordierite-biotite, sillimanite-biotite, sillimanite-cordierite-mica, sillimanite-garnet-mica, sillimanite-cordierite-garnet-mica, microcline-biotite, muscovite-microcline-biotite and sillimanite-garnet-cordierite-microcline-biotite gneisses. They contain quartz, K-feldspar (orthoclase, microcline), plagioclase, biotite, muscovite, sillimanite, cordierite, garnet, hornblend, sericite, Fe-Ti oxide, ±apatite, ±hematite, ±zircon, ±hercynite (?). The amphibolitic rocks contain hornblende, oligoclase-andesine, Fe-Ti oxide and ±orthoclase. The rocks exhibit grano-, lepidograno-, fibrolepidograno-, nemato-, nematograno-, lepidonemato- and porphyro- blastic textures. In some gneiss, there are pre-kinematic and syn-kinematic mineral growth, and cordierite porphyrpblasts containing sillimanite, hercynite (?) and garnet inclusions.

Possible mineral reactions in gneissic rocks are as (1) Muscovite + quartz → K-feld. + sillimanite + H_2O, (2) chlorite + muscovite (or chloritoid) + quartz → garnet + biotite + H_2O, (3) garnet + sillimanite + quartz → cordierite, (4) sillimanite + garnet → cordierite + hercynite, (5) biotite + sillimanite + plagioclase + quartz→garnet + cordierite + K-feld. + H_2O. Possible mineral reaction in amphibolites is albite + actinolite + epidote + chlorite → plagioclase (An>17) + hornblende. All these features suggest amphibolite facies P-T conditions.

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