

A preliminary review of metallogenic regularity and minerogenetic series of copper deposits in China

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Copper resources in China are abundant, but copper imports have also been required for a long time. Based on data from 814 copper deposits and other mineralized occurrences, the spatial distribution of copper resources in China can be shown, and the statistics for the temporal distribution of copper deposits can also be presented. There are five main types of copper deposits in China accounting for more than 90% of total copper resources. These include porphyry, skarn, stratiform (metamorphosed stratiform type and copper-bearing sand shale type), volcanic-sedimentary, and copper-nickel sulfide type deposits. Each type of copper deposit has its own characteristics of spatial distribution, metallogenic epoch, copper source(s), occurrence, ore mineral assemblages, grade, etc. The metallogenic pattern of copper deposits is also connected with the theory of "minerogenetic series of ore deposits" in China, which has been widely accepted and used by Chinese geologists for mineral exploration for the past 30 years. This theory involves group of ore deposits based upon correlations of space, time, and origin related to a certain geological and metallogenic processes in a certain region, so it includes all major factors of ore systems. According to the metal composition of minerogenetic series, there are 30 minerogenetic series of copper deposits in China. Combined with the evolution of geology and mineralization in China, the characteristics and the temporal and spatial distribution of the minerogenetic series of copper deposits can be analyzed relative to geological time. There are seven minerogenetic series of copper deposits formed in the Precambrian with mainly sedimentary metamorphic type and magmatic rock type copper deposits. There are eight minerogenetic series of copper deposits of Paleozoic age, mainly marine volcanic rock type copper deposits. There are 13 Mesozoic and two Cenozoic minerogenetic series of copper deposits dominated by porphyry type and skarn type copper deposits. Copper deposits in Tibet have been significantly explored in recent years, and there are two minerogenetic series of copper deposits in Tibet. The study of the metallogenic regularity and minerogenetic series of copper deposits has helped to understand major issues such as ore-formation conditions of super-large copper deposits and how to predict more copper resources for exploration.