Skarn deposits are of significance (Einaudi et al., 1981; Zhao et al., 1990; Meinert, 1992, 1993; Mao et al., 1996, 2006, 2011; Misra, 2000), especially their economic importance is fully recognized (Boyle, 1979; Bache, 1987; Meinert, 1989; Sillitoe, 1989; Chen et al., 1992, 1997; Zhao et al., 1992, 1997; Chen, 1996). The large Tiantang Cu-Pb-Zn polymetallic skarn deposit of Guangdong Province occurs in the northeast edge of the Yangchun basin, which locates in the Qinzhou-Hangzhou metallogenic belt. It is hosted in the limestone of Devonian Tianziling, and the ore bodies occur in the skarn and skarnization marble as stratoids, lamellar, lenses and irregularity. Metallic minerals consist mainly of chalcopyrite, galena, sphalerite and pyrite while gangue minerals are composed of garnet, diopside, epidote, wollastonite, chlorite and so on. On the basis of geological field observations, the authors select main sulfides to analyze its S-Pb isotopic composition so as to trace and discuss the sources of ore-forming metal materials, and the age of the Tiantang Cu-Pb-Zn polymetallic deposit is determined by the Rb-Sr isochron method for sphalerite and three group of intergrowth mineral assemblage samples (pyrite and galena). S and Pb isotope show that the ore-forming material of the ore bodies in the Tiantang Cu-Pb-Zn polymetallic deposit was derived from crust-mantle hybrid (Zheng et al., 2012). The Rb-Sr isochron convinced us that the metallogenic epoch is about 98 Ma (Zheng et al., 2013), and it is thus held that the Late Cretaceous is the main time for the formation of the Tiantang Cu-Pb-Zn polymetallic deposit. Above all, characteristics of Tiantang Cu-Pb-Zn polymetallic deposit shows that it is a typical skarn deposit, which is resulted from the replacement of the marble by granitoid magma. It is may be related that Chinese mainland including South China Plate was in a sustained stretch phase, which was caused by changing movement direction of the Pacific Plate after 135 Ma.

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