Origin and Evolution of the Gacun Volcanic-Hosted Massive Sulfide Deposit in Sichuan，China: Hf and U-Pb isotopic Evidence

DAN YANG[1*], ZENGQIAN HOU[2], YUE ZHAO[1], KEJUN HOU[1], SHIHONG TIAN[1]

[1] MNR Key Laboratory of Metallogeny and Mineral Assessment, Institute of Mineral Resources,CAGS，Beijing, 100037，China
(*correspondence:yangd_2013@163.com)

[2] Institute of of Geology, CAGS,Beijing 100037,China

The Gacun deposit is a typical massive sulfide deposit associated with Late Triassic seafloor calc-alkaline felsic volcanics(VHMS).In this paper, the latest rock geochemical data and zircon Hf isotopic data suggest，Yidun island arc is established on the basis of ancient continental crust from Ganzi-Litang oceanic subduction induced mantle melting of calc-alkaline basaltic magma，at the bottom of the crust may occur MASH process, andesitic magma formed, part of them became andesite ,and part mixed with magma of ancient crustal melting produced ,formed rhyolite that bearing the Gacun deposit.

Zircon U-Pb age data defines Gacun magmatic-hydrothermal mineralization sequence of events: 238Ma, arc magmatism led to the formation of andesite in the eastern of the deposit.233Ma, in arc zone (the western of the deposit), a large-scale bimodal magmatism formed rhyolitic volcanics , Gacun deposit exists in it. 221Ma, volcanic eruptions tended to end, magma eruption lost momentum, subvolcanic intrusion occurred ,a lava dome forming, which located under rhyolitic volcanic rocks that contained deposit. Meanwhile, as a "heat engine" driving hydrothermal convection cycle ,217 ± 1Ma, large-scale hydrothermal activity peaked. Consequently, the sulfide mineral deposited, Gacun VMS deposit produced.

On the basis of geochemistry, zircon U-Pb age and Hf isotope geochemistry，we reshaped the Gacun magmatic-hydrothermal system activity time, defined the origin of magma evolution ，and proposed metallogenic model of the deposit.

Figure 1:Magma and mineraliation events