Study on effectiveness of Pb isotope composition targeting method for tracing concealed hydrothermal uranium deposits

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A target tracing method for ^{204}Pb 、 ^{206}Pb 、 ^{207}Pb 、 ^{208}Pb isotope composition of hydrothermal uranium deposits has been established. This method includes four main steps[1,2,3]: studying the lead isotope composition of different types of rocks in the exploration area, establishing the range of metallogenic $^{208}\text{Pb}/^{204}\text{Pb}$ - $^{206}\text{Pb}/^{204}\text{Pb}$ 、 $^{208}\text{Pb}/^{204}\text{Pb}$ - $^{207}\text{Pb}/^{204}\text{Pb}$ 、 $^{208}\text{Pb}/^{206}\text{Pb}$ - $^{207}\text{Pb}/^{206}\text{Pb}$ isotope composition targets, sampling and analysis of survey section samples, and according I-IV grades evaluating survey points. The results of validity test in Dabu deposit of Taoshan uranium ore field show that the method can reflect the location of mineralization point or deposit regionally, and it is an effective regional hydrothermal prospecting method for concealed uranium deposits in soil-covered areas. Profile exploration has been carried out in Wangnitian area of this ore field, and the Yuchengpai area and its vicinity in southeast Wangnitian area are predicted to be favourable areas for prospecting.

[1] Sanford R F(1992), Geological Society of America Bulletin 104,1236-1245. [2] Foley N K, Ayuso R A(1994), Economic Geology 89,1842-1859. [3] Carr G R et al.(1995),Economic Geology 90,1476.