REE's in the mineral substance of Ashadze ore fields (MAR)

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Seafloor massive sulphides (SMS), chimneys, enclosing rocks (peridotites and basalts) and crusts were analysed for REE's on ore fields Ashadze- 1 (12º 58.4' N, 44º 51.8 W) and Ashadze-2 (12º 59.5' N, 44º 54.5 W) at MAR. Maximum values of REE sum (∑REE) in Ashadze-1 ore field, in accordance to different types, were distributed in the following manner (ppm): in peridotites – 10.40; in basalts – 16.63; in chimneys – 12.27; in SMS – 12.72; in crusts – 168.75. Maximum values of ∑REE in Ashadze-2 ore field: in peridotites – 15.31; in basalts – 26.39; in SMS – 7.72; in crusts – 218.46.

In all types one can see a positive europium anomaly $Eu_{(a)}$. Peridotites of Ashadze-1 and Ashadze-2 have maximum $Eu_{(a)}$ of 7.36 and 2.83 respectively. Enhanced $Eu_{(a)}$ (2.25) is also discovered in SMS and chimneys of Ashadze-1 ore field.

In Figure 1 vertical lines illustrate the ratios (minimum and maximum values) of light and heavy REE's (LREE/HREE) for all the analysed types (rocks, SMS, chimneys and crusts) of ore fields Ashadze-1 (blue arrows and circles) and Ashadze-2 (red arrows and circles).

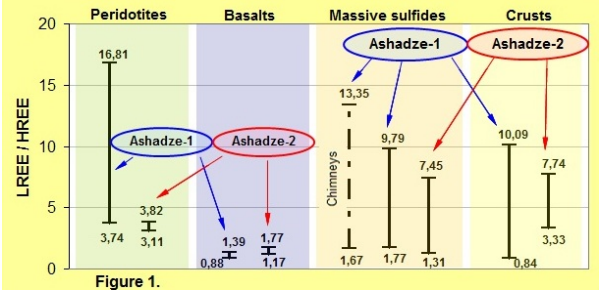

Figure 1.

Maximum concentration of ∑REE in crusts is determined by their mineralogical and structural and textural peculiarities.

The enhanced $Eu_{(a)}$ in SMS is inherited from rocks.

A significant fractionation of LREE/HREE in all types was discovered in Ashadze-1 ore field in comparison with Ashadze-2 ore field. The difference in fractionation of REE's can be related to the peculiarities of hydrothermal activity and the age of ore fields.