

# **REY geochemistry of groundwaters and corresponding rocks from Sikhote-Alin ridge, Primorye, Russia**

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In numerous studies it was shown that the patterns of the rare earth elements including yttrium (bring together to REY) of the groundwater reflect those of their host rock [1, 2].

The first data about REE geochemistry in groundwaters from Sikhote-Alin ridge were presented in [3, 4], but these data deal with only one type of water in region (high pCO<sub>2</sub> springs). Presently, we indicated new results of REY contents and distributions in several types of water (fresh, cold CO<sub>2</sub>-rich, thermal and brackish) and corresponding bedrocks (sandstone, granite and rhyolite) of Sikhote-Alin ridge.

In fresh groundwaters the REY concentrations are low (up to 1.01 ppb) and REY-patterns rise from La to Eu and decline from Eu to Lu with clear positive Eu anomaly, negative Ce anomaly. In cold CO<sub>2</sub>-rich mineral springs the REY contents are sufficiently high and can reach 25.0 ppb. REY-patterns show positive Eu anomaly, small negative Ce and pronounced rise from La to Lu. Thermal waters are characterized by very low REY contents (up to 0.29 ppb) and REY patterns, which is almost flat with minor increment from La to Gd and smooth reduction from Ga to Lu. Variable negative Ce and Eu anomalies are exhibited. The sum of REY in the brackish water is almost an order of magnitude higher than in the thermal water, ranging from 0.11 to 0.92 ppb. REY patterns resemble closely those of thermal waters but with remarkable positive Eu anomalies.

REY-patterns of corresponding bedrocks are decline from La to Lu with obvious Eu anomaly. Negative Eu anomaly is fixed in sandstone and garnites, whereas positive Eu anomaly is typical for rhyolites. Comparison REY pattern of groundwater with their bedrocks indicate that in whole REY can used as fingerprints for all types groundwaters from Sikhote-Alin ridge excluding high pCO<sub>2</sub>-rich springs.

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1]Smedley (1991) *Geoc.Cosmoc.Acta* **55** 2767–2779.  
[2] Johannesson et al (1997). *Geoc.Cosmoc.Acta* **61** 3605–3618. [3] Kharitonova et al. (2007) *Proc. of WRI-12.* 969-972. [4] Kharitonova et al. (2007) *Appl.Geo.* **22** 1764-1776.