



Fig. 1. Distribution patterns of REE in the samples.

The geochemistry of 58 samples from the Late-Palaeozoic Measures North China had been studied by Huang (1999), and the results also showed Eu had negative anomaly, with a value of 0.68 $\mu\text{g/g}$, and the distribution patterns are also a “V-shape” curves. All of these conclude that the geochemistry of REE in the Late-Palaeozoic Measures North China is similar and rare earth elements have the same source and tectonic background. The Eu is negative anomaly in terrigenous rocks, so Eu is usually negative anomaly in the coal that controlled by terrigenous.

The average of LREE/HREE is 11.91, and it shows LREE is enrichment and HREE is depletion. The results are consistent with the reports by Liu *et al.* (1998), Zhao *et al.* (2002) and Huang *et al.* (1999), and also indicate that REE have the same source.

5. Conclusions

(1) The concentration of REE is 23.41-343.76 $\mu\text{g/g}$, and 205.02 $\mu\text{g/g}$ in the samples from Coal 5 in Gequan Mine. The average of $\sum\text{REE}$ in rock samples is higher than that in coal samples;

(2) The values of $\sum\text{REE}$, LREE and HREE decreased from the bottom to top of the seam;

(3) REE distribution pattern of samples GQR, GQF, GQM, GQB are characterized by a “V-shape” curve with obviously Eu negative anomaly, and they are inherited by the source rock. The sample GQT was influenced strongly

by marine environment.

Reference

- Benabid, H., Ghorab M.F., Djebaili, A., 2007. Cadmium as an environmental pollutant—Study of Evolution of cadmium, its effects on beans (*Phaseolus Vulgaris*) and its interaction with zinc. *World Journal of Engineering* **4**(4), 99-103.
- Birk, D., White, J. C., 1991. Rare earth elements in bituminous coals and underclays of sydney basin, Nova Scotia: Element sites, distribution, mineralogy. *International Journal of Coal Geology* **19**, 219-251.
- Cullers, R. L., Chaudhuri, S., Arnold, B., 1975. Rare earth distributions in clay minerals and in the calysized fraction of lower permian havensville and eskridge shales of kansas and oklahoma. *Geochimica et Cosmochimica Acta* **39**, 1691-1703.
- Dai, S. F., Ren, D. Y., Li, S. S., 2003. Modes of occurrence of rare earth elements in some late paleozoic coals of North China. *Acta Geoscientia Sinica* **24**(3), 273-278 (in Chinese with English abstract).
- Dai, S. F., Ren, D. Y., Li, S. S., 2002. Occurrence and sequential chemical extraction of rare earth element in coals and seam roofs. *Journal of China University of Mining and technology* **31**(5), 349-353 (in Chinese with English abstract).