

Geochemical features of heavy metals in estuary sediments of the Pearl River

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Recently, Liu and Li [1] investigated heavy metal enrichment in estuary sediments of the Pearl river 1). Liu *et al.* [2] reported the effect of heavy metals on water ecosystems of the Pearl river 2). In this paper, spacial distribution of Cr, Pb, Zn and Cu in estuary sediments of the Pearl river were systematically studied and their relation to major elements and mineral compositions of sediments were explored.

57 surface sediment samples were collected from different monitoring stations in the estuary region of the Pearl river and analyzed for heavy metals Cr, Pb, Zn and Cu. Several results in this study were as follows. 1) Cr concentration changes between 32.9 μ g/g and 128 μ g/g with an average of 91.36 μ g/g. Pb concentration varies from 36.2 μ g/g to 94.5 μ g/g with a mean of 58.1 μ g/g. Zn concentration changes between 94 μ g/g and 321 μ g/g with an average of 175 μ g/g. Cu concentration varies from 18 μ g/g to 119 μ g/g with a mean of 52.8 μ g/g. 2) As a whole, concentrations of heavy metals in sediments are higher in the west than in the east of the estuary of the Pearl river, and greatly decrease southeastwards at the south of Neilinding island. 3) There are good correlations among heavy metals Cr, Pb, Zn and Cu. These heavy metals also have good correlation with major elements (Ti, Fe, Mn, P, Al), especially Fe₂O₃ and P₂O₅. In addition, they are correlated with clay mineral content. 4) From 1997 to now, heavy metals Cr, Pb, Zn and Cu increase in concentration.

These results show that the estuary ecosystem of the Pearl river was slightly polluted by heavy metals from various sources. This study, supported by National Item 908, is helpful for environmental treatment of the Pearl river.

[1] Liu, W.X. & Li, X.D. (2003) *Journal of Environmental Sciences* **23** (3), 338-345. [2] Liu *et al.* (2003) *Journal of Tropical Oceanography* **22** (5), 34-38.

The relationship between terrestrial heat flow and coal-bed methane in Hedong Area

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Background

The research area is situated at the torsion-fold belt of western shanxi, at the eastern of Ordos. Luliang mountains lies east of the research area, and the Western crossed the Yellow River, converged with Yi Shaan slope tectonic belt, and connected Weibei uplift in South Basin. The main seam in the research region is Carboniferous - Permian, and the Grand coal seam is the coal 5 # of the Shanxi Formation and the coal 8 # of Taiyuan Formation.

The Geothermal Gradient and Terrestrial Heat Flow in Hedong Region

A typical area, Hedong Area, was selected for our study. The study shows that the geothermal gradient values range from 2.8 to 3.1°C per 100meters from this area. These values are lower than the average values both from the N-China Basin and from the Songliao Basin, 3.6°C per 100meters and 4.2°C per 100meters, respectively [1]. Furthermore, these values from Hedong Area distribute more evenly than those from the other two areas in space.

The average of heat flow values from Hedong Area is 69.6mW/m² [2], which is slightly higher than that from its adjacent area, Qinshui Basin (62.69±15.2 mW/m² [3]), as well as the average value from the mainland China (61±15.5 mW/m² [4]). It is, however, significantly lower than that from the System of Shanxi Graben (76.19 mW/m²). The spatial distribution of heat flow values from North to South has a high to low trend.

Discussion of Results

According to the spatial distribution of the geothermal gradient and that of the preliminary explored coal-bed methane in Hedong Area, a good relationship is found in our study. The maximum gas is located in Daning.

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[1] Hu S.B. *et al.* (2001) *Chinese J. Geophys.* **44** (5), 611-626.

[2] Sun Z.X. *et al.* (2005) *Chinese Science Bulletin* **50** supplement, 93-98. [3] Sun Z.X. *et al.* (2006) *Chinese J. Geophys* **49** (1), 130-134