

## Application of nano-powders in the sewage treatment

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A certain amount of nano-powders have been added in different concentrations of chemical oxygen demand (COD) of water samples and putting a certain period of time. The change of water turbidity, conductivity and chemical oxygen demand (COD) were used as the criterion of sewage purification. The chemical oxygen demand (COD) of experimental sewage solution is 500mg/L, 1500mg/L, 2000mg/L, 3000mg/L and 5000mg/L respectively. The barium titanate nano-powders and activated carbon nano-powders, the size of 200nm, were added in these solutions and laid up for seven days. The experimental results showed that activated carbon nano-powders and barium titanate nano-powders did not affect on the conductivity of water samples obviously.

The barium titanate nano-powders can significantly reduce the turbidity of water samples. The turbidity of water samples changed from 123 to 9 degree when the weight ratio of barium titanate nano-powders were from 0.25%; 0.5%; 0.75% to 1% respectively. However, the purification of the chemical oxygen demand (COD) is not high, purifying rate of sewage is about 45%. When the chemical oxygen demand (COD) exceed 1650 mg/L, purifying rate of sewage is only 25%. If the content of barium titanate nano-powders increased, purifying rate did not change obviously.

The effect of activated carbon nano-powders on the turbidity and chemical oxygen demand (COD) of sewage was obvious. The turbidity of water samples changed from 123 to 13 degree and the purifying rate of chemical oxygen demand (COD) from 60% to 95% when the weight ratio of activated carbon nano-powders were from 0.25%; 0.5%; 0.75% to 1% respectively. Even the chemical oxygen demand (COD) exceed 5000mg/L, the purifying rate of chemical oxygen demand (COD) of sewage can reach 92% and a high concentration of chemical oxygen amount of (COD) could be reduced to meet the requirement of waste water discharge standards during some period.

## Platinum-Group Element mineralization in black shales in Xinjiang, China

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### Geological Setting

Black shales are favorable host rocks for many types of ore deposits. Among them gold and PGE are very important deposits to black shales. There exists vast areas of the black shales in Xinjiang of China, which distribute among Tianshan Mountains, Tarim Basins and Beishan districts. The main bearing-ore strata are Sawayaertun formation at SW Tianshan and Heijieshan formation at East Tianshan (Fig.1).

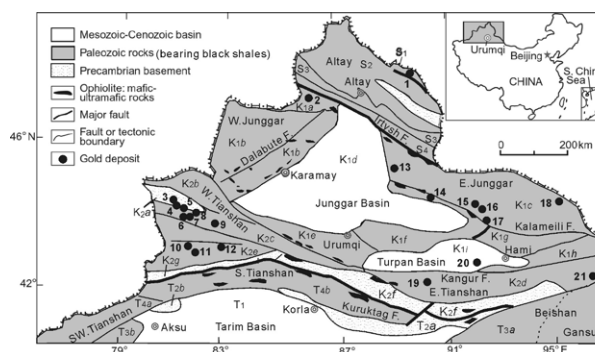


Figure 1 The sketch map of structures and rocks

Although PGE ore deposits have not yet discovered in Xinjiang at present, but many exceptionally vestiges of PGE to be demonstrated [1], and had discovered gold ore deposits related with black shales, such as Sawayaertun Gold deposit. Up on flood plain sediment, a geochemical province of Pt and Pd of a content of 0.8 ng/g is delineated at East Tianshan.

### Forming Conditions

Hercynian-Indosinian tectono-magmatism under a post-collision extensional environment provided heat and metal extracted from basement rocks and mafic body. Shear zones control the metallic fluid, such as Muruntau gold deposit in Uzbekistan, located in the southwest Tianshan mountains and hosted in Early Paleozoic black carbonaceous shales [2].

[1] Wang X, et al. (2007) *Geological bulletin* **26**, 1519-1530.

[2] Graupner T. et al. (2000) *Mineralogical Magazine* **64**, 1007-1016.