Dissolution rates of standstone type uranium ore in Ordos basin, China

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Uranium ore podwer, sampled in Dongsheng sandstone type uranium deposit in northeast Ordos basin, was used to determine dissolution rates in a continuous flow column reactor described by Gong *et al*. [1] in deionized water with 0.2 ml/min flow rate (*F*) at 20MPa (40.0442g) and 15MPa (35.0209g). The experimental conditions and uranium concentrations (*C*) of outlet solution are listed in the table below. The dissolution rates (*R*), calculated using geometric surface area (*A*) by $R=CF/A$, are shown in the figure below.

T/°C	50	100	150	200	250	300
20MPa	0.11	0.37	1.16	0.34	0.38	0.18
15MPa	0.44	1.09	0.62	0.43	0.34	0.25

Table 1: Uranium concentrations (10^{-6}mol/L) of outlet solution.

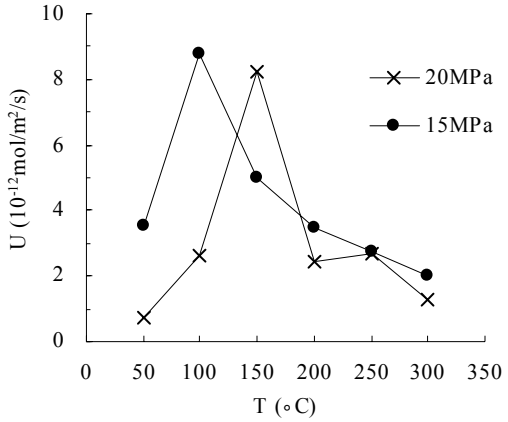

Figure 1: Dissolution rate with temperature.

The dominant dissolution temperature is 150°C at 20MPa and 100°C at 15MPa. The dominant dissolution temperature would decrease when pressure reduced.

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[1] Gong *et al*. (2003) *Acta Geologica Sinica* **82**, 994-1001.

Carbonaceous component of an Asian aerosol plume: Tracking the chemical signature during transport

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Severe air pollution plumes of air mass passed by Gwangju, South Korea between December 2 and 15, 2008. Chemical composition of $PM_{2.5}$ aerosol was determined by online *in situ* measurements. The organic carbon (OC) and elemental carbon (EC) were measured using the thermal transmittance method; PM mass and number were measured by online aerosol spectrometer; particulate ion were measured online by particle into liquid sampler (PILS) coupled with ion chromatography; and, black carbon (BC) was measured by multi-wavelength aethalometer. Trace gases (NO_2, SO_2 and O_3) were also measured by online analyzers. Transport pathway obtained by HYSPLIT back trajectory analyses confirmed that the plume had originated from northeastern China towards Gwangju area. During the peak periods of severe pollution events , OC concentration ranged 10 ~ 28 μg/m3, accounting up to 30% of the total $PM_{2.5}$ mass (60-250 $\mu g/m^3$). The OC/BC ratio decreased by 54% during the polluted periods, compared to the clean periods. Potassium, which was not detected during clean periods, were also evident (up to 3$\mu g/m^3$) during polluted periods. Correlations between particulate OC, chemical signatures and meteorological conditions were determined to analyze the temporal condition during the pollution event. It was found that the OC trend was strongly followed by sulfate and nitrate. Overall, investigation of aerosol plume episode strongly suggest that pollution loadings were induced by damped atmosphere and stable surface wind. Carbonaceous particulate is a major constituent of the aerosol plume, and there is a strong evidence that the plume is a mixture of biomass burning and industrial emissions.