

## **Drainage Fluid Variation Characteristics through Ion Monitoring During Coalbed Methane Well Production**

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**Abstract** This paper presents the variation characteristics of the fluid geochemical field in the process of coalbed methane(CBM) wells drainage. The drainage water samples were collected from nine already producing CBM wells located the Second North Mining Area of the Daxing Mine in TieFa Basin, China. And these samples were taken during June 1, 2011 to September 22, 2011. Then nine ions were tested through the Ion-chromatograph ICS-1500, including  $\text{Cl}^-$ ,  $\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ ,  $\text{HCO}_3^-$ ,  $\text{CO}_3^{2-}$ ,  $\text{K}^+$ ,  $\text{Na}^+$ ,  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ , and ionic spatial variation characteristic in the drainage water from the CBM wells were analyzed in 110 days. The results show that the drainage water from CBM wells is mainly from coal seams. The main hydrochemical type of the drainage is Na-HCO<sub>3</sub> type. The salinity of water is between 3500-8000 mg/L and with the growth of time, the salinity has a weak tendency of decrease. The water hardness is between 8-13 mg/L. The ion's spatial evolution characteristics of the CBM wells drainage water in research area proves that there are two kinds of ions to confirm the exist of fluid. The type I, including  $\text{Cl}^-$ ,  $\text{Mg}^{2+}$ , whose concentration is reduced when approaching the extracting center; The type II, including  $\text{Na}^+$ ,  $\text{HCO}_3^-$ ,  $\text{CO}_3^{2-}$ ,  $\text{K}^+$  and  $\text{Ca}^{2+}$ , whose concentration is increased when approaching the extracting center.

**Keywords** drainage water, ion monitoring, CBM well, Tiefa basin

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