

论文

山西阳泉地区太原组15号煤层夹矸中铵伊利石矿物研究

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摘要:

为解释山西太原组中铵伊利石矿物的成因, 采用偏光显微镜观察、X射线衍射、傅里叶变换红外光谱和热重分析等手段, 对山西阳泉地区太原组15号煤层夹矸中的铵伊利石矿物进行研究。研究发现, 铵伊利石主要富集在细粒级部分。铵伊利石的晶胞参数为: $a=5.212 0 \times 10^{-10} \text{m}$, $b=9.007 3 \times 10^{-10} \text{m}$, $c=10.513 6 \times 10^{-10} \text{m}$, $\alpha=\gamma=90^\circ$, $\beta=101.349 7^\circ$ 。铵伊利石成因主要有两种: ① 在成岩过程中由高岭石转变而来; ② 裂隙中自生结晶形成。铵伊利石中氮元素主要来自于热演化过程中有机质的裂解和微生物的降解, 裂隙中的自生铵伊利石也可能与岩浆热液有关。

关键词: 铵伊利石; 成因; 矿物学; 晶胞参数

Mineralogy of ammonium illite in the partings of coal No.15 in Taiyuan Formation of Yangquan, Shanxi Province

Abstract:

Aiming at the causes of ammonium illite in the partings of coal No.15 in Taiyuan Formation of Yangquan, Shanxi province, the mineralogy of ammonium illite was studied based on the polarized microscopy, X-ray diffraction, Fourier transform infrared spectrum and thermal gravimetric analysis. The results show that the ammonium illite mainly enriches in the fine fraction of claystone partings. The ammonium illite crystal unit cell parameters are: $a=5.212 0 \times 10^{-10} \text{m}$, $b=9.007 3 \times 10^{-10} \text{m}$, $c=10.513 6 \times 10^{-10} \text{m}$, $\alpha=\gamma=90^\circ$, $\beta=101.349 7^\circ$. There are two main origin types of ammonium illite: one is transformed from kaolinite in the process of diagenesis, and the other is authigenic crystallization in the cracks. The nitrogen in ammonium illite originates mainly from the pyrolysis of organic matter in diagenesis and biological degradation, but that in the cracks may be related to magmatic hydrotherm.

Keywords: ammonium illite; origin; mineralogy; unit cell parameters

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