

煤层气

沁水盆地南部地区煤层气汞含量特征简析

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摘要:

随着人类对天然气需求的不断增加,煤层气作为一种新兴的能源受到人们越来越多的重视,但天然气中普遍含汞的性质决定了我们有必要对其加强研究。按照天然气中汞的成因假说,沁水盆地南部地区煤层气汞含量可能较高。为了验证这一问题,采用德国Mercury Instruments公司生产的痕量汞检测仪UT 3000对该地区7口煤层气井和1处煤层气液化站进行检测。检测结果显示该地区煤层气汞含量普遍很低,均在 10 ng/m^3 以下,因此在煤层气勘探与生产过程中不存在汞的威胁。为了解释这一现象,开展了煤粉热吸汞、释汞实验。实验数据表明当加热温度大于 120°C 时煤粉释汞,而在小于 100°C 时煤粉吸汞,吸汞与释汞的温度平衡点介于 $100\sim 120^\circ\text{C}$ 之间。沁水盆地南部地区煤层埋藏较浅,地层温度一般不会超过 56°C ,在此地层温度下,煤系有机质对汞具有强烈吸附作用,这是导致该地区煤层气含汞很低的根本原因。

关键词:

Mercury Concentration in Coalbed Methane in South of Qinshui Basin

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Abstract:

With increasing demand of natural gas in our country, coalbed methane as a kind of new energy sources is becoming more and more important. But it should be paid attention on mercury concentration in of natural gas. According to hypothesis of mercury origin in natural gas, mercury concentration in coalbed methane in the south of Qinshui basin would be high. To test it, we use the ultra mercury detector of UT 3000 made in Germany Mercury Instruments to detect mercury concentration in 7 coalbed methane wells and a LNG plant. The result showed that there was very low concentration of mercury in coalbed methane, less than 10 ng/m^3 . So, it is safety for exploiting and developing coalbed methane. We did the experiment of coal flour thermally absorbed and released mercury to explain this phenomenon. The result showed that coal flour absorbed mercury when heating temperature is below 100°C ; in contrast the coal flour released mercury when the temperature is more than 120°C . So the balance of absorbing and releasing mercury for coal flour is among 100°C and 120°C . In the south of Qinshui basin, the burial depth of coal bed is relatively shallow, and the geo-temperature is generally less than 56°C . In the condition of low geo-temperature, mercury was strongly absorbed by organic matter in coal measure, resulting in the low mercury concentration in coalbed methane.

Keywords:

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