

## 中国CO<sub>2</sub>煤层储存容量初步评价

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收稿日期 2005-2-3 修回日期 2005-5-31 网络版发布日期 2007-2-13 接受日期 2005-2-3

**摘要** 地下储存是降低大气中CO<sub>2</sub>含量以缓解温室效应的有效措施之一。其中煤层储存可有效地减少CO<sub>2</sub>排放量,同时增加煤层气可开采量,降低CO<sub>2</sub>地下储存的成本。煤层储存CO<sub>2</sub>是将CO<sub>2</sub>吸附在煤基质中,具有安全可靠的特点。中国煤层分布广泛,煤炭资源储量丰富,是CO<sub>2</sub>地下储存的首选措施。根据中国煤炭和煤层气勘探资料,不同性质煤的储量分布及CO<sub>2</sub>与CH<sub>4</sub>置换比例,对中国主要含煤层气区深度300~1 500 m范围内的煤层CO<sub>2</sub>储存潜力进行初步评价。结果表明,利用注CO<sub>2</sub>增采煤层气技术可使中国总的煤层气可采量达1.632×10<sup>12</sup> m<sup>3</sup>,可储存约120.78×10<sup>8</sup> t CO<sub>2</sub>,相当于2002年全国CO<sub>2</sub>排放量的3.6倍。

**关键词** [环境工程; 二氧化碳; 煤层气; 注CO<sub>2</sub>增采煤层气; 吸附](#)

分类号

## PRELIMINARY ESTIMATION OF CO<sub>2</sub> STORAGE CAPACITY OF COALBEDS IN CHINA

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### Abstract

Geological storage is an effective means of reducing anthropogenic atmospheric emission of CO<sub>2</sub> to alleviate the worsening global climate change. CO<sub>2</sub> storage in coalbeds can effectively reduce the emission of CO<sub>2</sub>, and at the same time, it can enhance the recovery of coalbed methane to reduce the cost of CO<sub>2</sub> geological storage. The CO<sub>2</sub> molecules are absorbed on the surface of coal matrix and the methane molecules can be released when CO<sub>2</sub> is injected into the coalbeds. The absorbed CO<sub>2</sub> on coal matrix can be kept stably in coalbeds for geologic time. There is a huge storage capacity for CO<sub>2</sub> in coalbeds in China for the wide distribution and abundant resources of coal. Putting CO<sub>2</sub> into coalbeds should be the prior choice for its security and safety. According to the latest prospecting data of coal and coalbed methane resources in China and the replacement ratio between CO<sub>2</sub> and CH<sub>4</sub> in the coal with different ranks, it is estimated that the CO<sub>2</sub> storage can be performed from depth of 300 m to 1 500 m in the main coalbed methane basins in China. The total recoverable coalbed methane resources will approach to 1.632×10<sup>12</sup> m<sup>3</sup> if the CO<sub>2</sub>-enhanced coalbed methane recovery(CO<sub>2</sub>-ECBM) technology is utilized, and the CO<sub>2</sub> storage capacity in coalbeds is about 120.78×10<sup>8</sup> t, which is about 3.6 times as the total CO<sub>2</sub> emission of China in 2002.

**Key words** [environmental engineering; carbon dioxide; coalbed methane; CO<sub>2</sub>-enhanced coalbed methane recovery\(CO<sub>2</sub>-ECBM\); absorption](#)

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