

Supporting information

The effect of fixed and removable gas-injection patterns on the expansion of reaction zones during underground coal gasification

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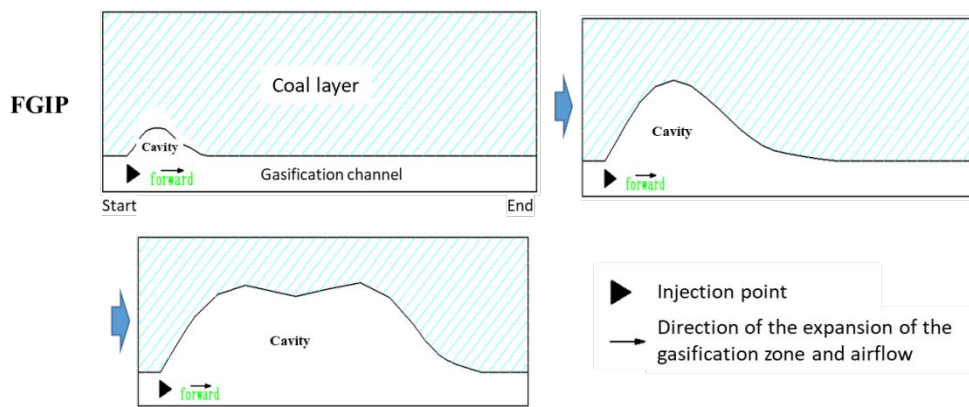


Fig. S1 Abridged general view of FGIP pattern.

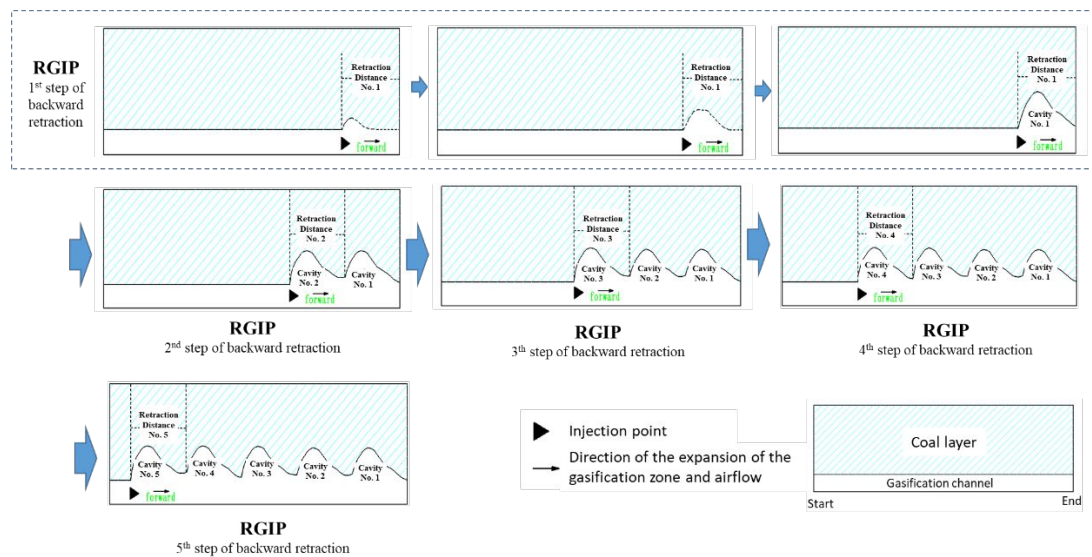


Fig. S2 Abridged general view of RGIP pattern.

Text S1 The difference between FGIP and RGIP:

(1) In RGIP and FGIP processes, some explanations about directions are given as follows including gas flow, cavity expansion and removable gas-injection point. Firstly, the gas flows toward the end of the gasification channel, it is in the same direction that the cavity expands. Secondly, in the RGIP process, the gas-injection point recedes back from the end to the start of the gasification channel.

(2) There were five retraction stages in RGIP process. In the each stage the cavity formed. The first gas-injection point was closest to the end of the gasification channel. During the formation of the cavity, the gas-injection point was moved backward at first to the fixed point for a certain distance, then the coal would be gasified in the retraction stage and the cavity was formed at the same time. The volume of the cavity increased in the forward direction mainly with the coal gasification, until the cavity expanded to the end of this retraction stage and the gasification reaction was over. The gas-injection point would be receded next and the new cavity would be formed.

In other words, in each retraction stage the cavity expanded forward from the gas-injection point to the end of this retraction stage. However, in the whole gasification channel, the cavity was formed backward with the removable gas-injection point.

(3) In FGIP process, the gas-injection point was fixed in the start of the gasification channel. During the coal gasification the cavity expanded greater and greater mainly in the forward direction from the start to the end of the channel.

(4) In a word, the cavity formation in RGIP and FGIP processes was different. In RGIP process, the cavity was formed in each retraction stage. In the FGIP process, the cavity expanded from the gas-injection point to the end of the channel all the time, which was similar to cavity formation in each retraction stage of RGIP process.