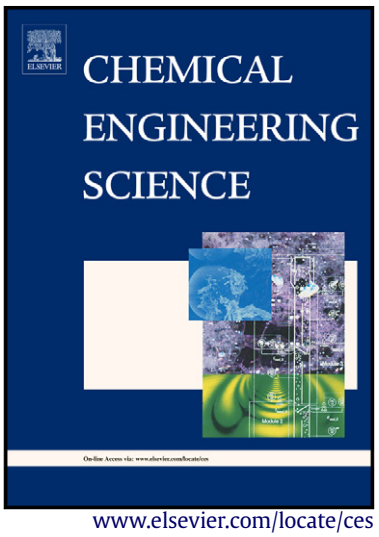

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Multi-stage energy analysis of steam explosion process

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Abstract

Owing to the deficiency of investigating steam explosion on energy utilization, in this study, we analyze the heat transfer mechanism and energy consumption of steam explosion process. Based on years of research, we propose that energy consumption of steam explosion not only involves holding pressure and instantaneous decompression stages but the upward stage of pressure. On this basis, a multi-stage heat transfer model of steam explosion process integrating technical features is established. Results reveal the significance of pressure boost stage which contributes the vast majority of total energy consumption. The amount of steam consumption per unit mass of dry materials *m*' is presented to quantitatively evaluate the energy consumption under various factors,