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A new kind of biobriquette, with scallop shell as desulfurizer, was developed in this study, and its self-desulfurization behavior was studied by combustion experiments. For comparison and further understanding on the self-desulfurization characteristics, the biobriquettes with Tsukumi limestone and calcium hydroxide as desulfurizers were also investigated experimentally. The influence of the furnace temperature, types of coal and desulfurizer, and structure of added desulfurizer on the behavior of desulfurization was elucidated by measuring the time concentration history of SO<sub>2</sub> emission in combustion flue gas and calculating the desulfurization efficiency. The desulfurization efficiency was not sensitive to the temperature in the range 973-1173 K. However, the efficiency was strongly affected by coal type, and it changed from about 25 to 67% for the eight tested types of coals under the same experiment conditions. The desulfurization efficiency has been found to also be a function of the calcination temperature of desulfurizer. On the basis of experimental results, a shrinking-core reaction model was used to simulate the desulfurization process during the char combustion of biobriquette by a finite volume numerical method. The calculated results generally agreed with the experimental results. Finally, an improvement on the biobriquette structure, namely dual layered biobriquette, was proposed and tested in order to improve the desulfurization efficiency.

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