Drying Characteristics of Fine-Particle Lignite in Paddle Dryers

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Abstract: Drying is an important way to improve the quality of lignite with high moisture. In this paper, a single-shaft paddle dryer experimental system was built to investigate the drying characteristics of fine-particle lignite with diameter 0-5mm. The experimental results show that with the increasing in shaft rotation speed the flow rate of lignite increases linearly approximately and the residence time decreases correspondingly. Increasing the inclination angle helps increase the flow rate. Both shaft rotation speed and heating source (heat transfer oil) temperature have significant effects on outlet moisture content of lignite. Shaft rotation speed affects the average heat transfer coefficient greatly and heating source affects it weakly. It is found that for 5-12mm coarse-particle lignite, flow is not smooth and the average heat transfer coefficient is much less than that of fine-particle lignite. This research shows that it is feasible technically to dry fine-particle lignite using paddle dryer, which is not suitable for drying coarse-particle lignite.

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