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F-PDFB- fine coal beneficiation by pulsed dense-phase fluidized bed

Xuchen Fan, Liang Dong, Yuemin Zhao, Zhenfu Luo, Chenyang Zhou, Bo Zhang and Chenlong Duan
China University of Mining and Technology, China

High efficiency dry coal separation technology is beneficial to improve the efficient utilization of coal energy. While with the increasing content of fine coal, there is a lack of mature and efficient dry separation technology. In this study, a novel pulsed dense-phase fluidized bed was introduced into fine coal separation. Due to the action of the vibration energy of pulsing air flow, the fluidization quality of the fluidized bed was improved; the homogeneous stability of the bed density was strengthened. Due to the effect of gas pulsation frequency on the bed density, the frequency was divided into three regions: low-frequency region, middle-frequency region and high-frequency region. In the middle-frequency region, the bed density was uniform in the cross section of the fluidized bed, which was suitable for fine coal separation. At the same time, the circulating current and back mixing of heavy-medium particles were restrained. Based on basic theory and experimental research, the experimental study on separation of fine coal with -6+1 mm size fraction in pulsed dense-phase fluidized bed system was conducted. The separation results showed that the probable error (E) of -6+3 mm and -3+1 mm were 0.19 g/cm³ and 0.10 g/cm³ respectively. Comparing with raw coal, the ash content of the clean coal is -6+3 mm and -3+1 mm decreased by 18.66% and 12.07% respectively. It indicated that using pulsed dense-phase fluidized bed could achieve high efficiency separation of fine coal.

Biography

Xuchen Fan is a PhD candidate from China University of Mining and Technology. His Major is Mineral Processing Engineering. His supervisors are Prof. Zhao Yuemin and Prof. Dong Liang. His research interests include fine coal dry beneficiation. He has published papers in *Fuel*, *Particulate Science & Technology* and *Coal Technology*, respectively.

dong_liang2008@126.com

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