

Analysis of physical characteristics of grinding equipment by discrete element method (DEM) simulation and its application for research on the grinding mechanism of each equipment - (1) study of traditional ball mill

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A simulation of the three-dimensional motion of grinding media in the traditional ball mill for the research of grinding mechanism and investigating of physical characteristics of grinding equipment have been carried out by 3-dimensional discrete element method (DEM). The motion of the balls and the forces acting on them were calculated, and the results showed that the forces applied to the balls increased greatly as the revolution speed of the mill. The main force acting on the balls was the normal force, and was higher than the tangential force. An experiment was performed in which this strong force was used to grind copper powder; the increase rotation speed required to change the particle morphology and to make composite between two materials due to the impact power increase of the grinding media.