

A Planetary Ball Mill Simulation by DEM(Discrete Element Method) for the Ball Movement and Grinding Force

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To make sub-micron particles, some types of ball mills are used according to their grinding characteristics. In the present work, a series of simulation analysis of ball mills, a simulation of the three-dimensional motion of grinding balls in the planetary ball mill for the research of grinding mechanism has been carried out by DEM(Discrete Element Method). Ball movement and forces acting on the balls were calculated at various rotation speed of planetary ball mill. Forces acting on the balls were expressed into normal force and tangential force and normal forces were more 5 times higher than tangential forces. Total forces at all balls at various rotation speeds from 300 to 1,100 rpm increased very rapidly, while its rotation speed increased 4 times, the total force increased about 14 times. As result, for the grinding mechanism of a planetary ball mill, main forces acting on the balls is normal force and its acting forces are affected strongly by rotation speeds.