Response surface methodological approach to minimize particle size of ibuprofen

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Ibuprofen is a highly crystalline substance with the pharmaceutical properties of poor solubility and low bioavailability. The size reduction of ibuprofen is needed to improve the solubility. The objective of this study is to minimize the particle size of ibuprofen. Grinding of ibuprofen was carried out using a planetary mill. Grinding parameters were optimized using Box-Behnken experimental design method. The physical characteristics of ground ibuprofen were investigated for the particle size by particle size analyzer. The optimum conditions for the milling of ibuprofen were 290rpm of the revolution number of mill, 24.6g of the weight of sample, and 10 minutes of grinding time. The measured value of the particle size of ground ibuprofen at these optimum conditions was 13.5μm.