FINE GRINDING IN STIRRED BALL MILL

By

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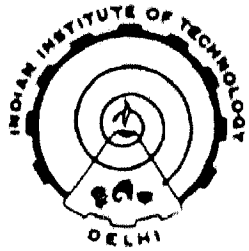
Thesis submitted
in fulfilment of the requirements
for the degree of
DOCTOR OF PHILOSOPHY



to the

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CERTIFICATE

This is to certify that the thesis entitled, **"FINE GRIDING IN STIRRED BALL MILL"** being submitted by Mr. Mahmoud Habibian Ramian to the Indian Institute of Technology, Delhi for the award of the degree of **'Doctor of Philosophy'** is a record of the bonafide research work carried out by him. Mr. Ramian worked under our guidance for the submission of this Thesis which is to our knowledge has reached the requisite standard.

The Thesis or any part thereof has not been submitted to any university or institute for the award of any degree or diploma.

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(M. Habibian Ramian)

ABSTRACT

Fine grinding has drawn greater attention due to recent developments of high quality material like ceramic super conductors and ferrite powders etc. Attritor is the most efficient mill in producing ultrafine products. In Attritor solid particles undergo breakage due to impact action and shearing force.

The present work is taken to study the comminution characteristics such as selection and breakage functions. The selection and breakage functions are determined experimentally and used in predicting the product size distribution from a mass balance equation.

Effect of variables such as powder loading, Ball loading, speed of rotation and time of grinding on the performance of the mill is studied.

The selection and breakage function parameters are estimated from mass balance equation by back - calculation technique. This simulation helps to predict the product size distribution with minimum error deviation from experimental product size distribution.

The effect of Ball size and Ball size distribution on mixed feed sizes are tested to establish optimum Ball to particle size ratio d_B/d_P for maximum specific rate of breakage.

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