## Accepted Manuscript

Mechanically Induced Reactivity of Gibbsite: Part 2. Attrition Milling

T.C. Alex, Rakesh Kumar, S.K. Roy, S.P. Mehrotra

 PII:
 S0032-5910(14)00474-4

 DOI:
 doi: 10.1016/j.powtec.2014.05.029

 Reference:
 PTEC 10284

To appear in: Powder Technology

Received date:7 March 2014Revised date:14 May 2014Accepted date:17 May 2014



Please cite this article as: T.C. Alex, Rakesh Kumar, S.K. Roy, S.P. Mehrotra, Mechanically Induced Reactivity of Gibbsite: Part 2. Attrition Milling, *Powder Technology* (2014), doi: 10.1016/j.powtec.2014.05.029

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# ACCEPTED MANUSCRIPT

### Mechanically Induced Reactivity of Gibbsite: Part 2. Attrition Milling

T.C. Alex<sup>a1</sup>, Rakesh Kumar<sup>a</sup>, S.K. Roy<sup>b</sup> and S.P. Mehrotra<sup>c</sup>

<sup>a</sup>CSIR- National Metallurgical Laboratory, Jamshedpur - 831 007, India <sup>b</sup>Indian Institute of Technology Kharagpur, Kharagpur - 721 302, India <sup>c</sup>Indian Institute of Technology Gandhinagar, Gandhinagar - 382424, India

#### Abstract

Mechanically induced reactivity of gibbsite in an attrition mill is focused in this paper. Reactivity of milled gibbsite, assessed in terms of its dehydroxylation and dissolution in alkali solution, is found to increase with the increase in milling time. Besides analysing the increased reactivity in terms of the changes in physicochemical characteristics, an attempt has also been made to correlate the reactivity with physicochemical changes. Changes in the characteristics of gibbsite during milling in an attrition mill and corresponding change in reactivity are compared with that observed during milling in a planetary mill described in part 1; thus a comparison of two different types of mills in terms of their efficiency in bringing out structural/reactivity changes is illustrated using the same feed stock, gibbsite.

**Keywords:** Mechanical activation, attrition mill, gibbsite, structural changes, amorphisation, reactivity.

#### 1.0 Introduction

Mechanical activation (MA) of gibbsite-its relevance along with a list of all earlier studies pertaining to MA of gibbsite- has been detailed in part 1 as a prelude to the mechanically induced reactivity of gibbsite during milling in a planetary mill. It has analysed the mechanically induced reactivity in terms of the ensuing changes in the physicochemical characteristics. Looking from the point of scale up to industrial level, planetary mill does not seem to be attractive, at lease for the present, in terms of throughput; maximum throughput available is around 5000 kg/h [1]. On the other hand attrition mills having capacity as high as 10000 1 (~50 t/h) is in operation and seems to remain unchallenged for some time in the scenario of high energy milling

<sup>&</sup>lt;sup>1</sup> Corresponding author email : tc\_alex@yahoo.com

Download English Version:

https://daneshyari.com/en/article/6677341

Download Persian Version:

https://daneshyari.com/article/6677341

Daneshyari.com