MSE 445/545: Ceramic Processing

Lecture 13:
Chapter 17&18: Crushing, Milling and Mixing

• Objectives:
  – Selection of crushing and milling equipment
  – Describe the particle fracture mode, and the size effect
  – Selection of mixing equipment
Equipment

http://video.google.com/videosearch?q=crushing&hl=en&emb=0&q=jaw%20crusher&hl=en&emb=0

http://video.google.com/videosearch?q=ball+milling&hl=en&emb=0&aq=f#
Selecting equipment

Fig. 17.3
Loading and fracturing of particles

\[ S_f = \frac{K_{lc}}{y\sqrt{c}} \]
Milling performance

• Eq. 17.3
Bulk solid transport
Mixing and mixing mechanism

[Diagram showing mixing processes: Convection, Shear, Diffusion]
Mixing equipment selection

![Diagram showing mixing equipment selection based on apparent viscosity (mPa·sec).](image)
More details on the mixers

Slurries and Pastes: Impeller mixer (Fig. 18.9)

Plastic body: (Fig. 18.10 a-e)

Granular and Powders: (pan mixer)

Reading assignment: Chapter 19