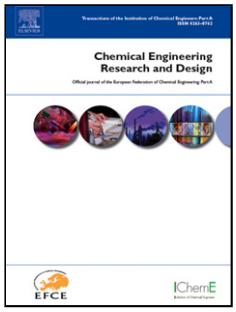

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PII: S0263-8762(18)30305-8
DOI: https://doi.org/10.1016/j.cherd.2018.06.019
Reference: CHERD 3228

To appear in:

Received date: 12-3-2018
Revised date: 22-5-2018
Accepted date: 13-6-2018

Please cite this article as: He, Yi, Guo, Feihong, Micromechanical analysis on the compaction of Tetrahedral Particles.Chemical Engineering Research and Design https://doi.org/10.1016/j.cherd.2018.06.019

Micromechanical analysis on the compaction of Tetrahedral Particles

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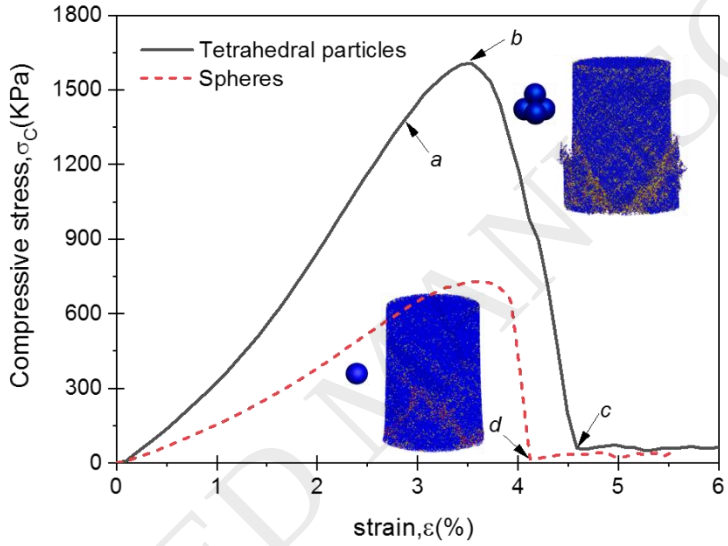
Graphic abstract



Highlights

- Compaction on tetrahedral particles was modelled by DEM.
- A gradual transition in coordination number due to reduced particle rearrangement.
- An enhanced resistance to bulk deformation due to interlocking and friction mobilization.
- Compressive strength is enhanced due to increased number of particle bonding.
- The dominant mode of bond failure is independent on particle shape.

Abstract

Understanding the roles of particle properties in powder compaction is important to many industrial products, such as tablets in pharmaceutics, briquettes in iron ore handling and green compacts in powder metallurgy. However, the role of particle shape in bulk compression and how it is related to the properties of the final compact are not well understood. In this study, we