

Ref: **203-038**

Apresentador - **Luis Antonio Genova**

Evaluation of compaction behaviour of spray-dried alumina by Hg porosimetry and SEM

Santos, A.A. (1); Cosentino, I.C.(1); Genova, L.A.(1)

(1) IPEN

Compaction is a widely used fabrication process for ceramics due to its low cost and high productivity. The majority of defects are formed at this stage, and consequently the evaluation of the process parameters is extremely important. Alumina aqueous slurries with different rheological properties were spray-dried in different conditions, in order to obtain granules with different resistance to crushing. Powders were pressed in varying pressure, temperature and humidity conditions. Scanning electron microscopy (SEM) analysis was performed to observe the microstructural evolution of the fractured surfaces in different compaction conditions. The Hg porosimetry analysis showed the decreased of intra- and intergranular porosities up to complete elimination of the intergranular porosity as the pressure increased. The glass transition temperature of the binder (T_g) significantly affects the microstructure of green bodies: powders pressed at higher temperatures than T_g presented more intergranular porosity elimination at the same compaction pressure, through plastic deformation and fracturing of granules. Hg porosimetry analysis were suitable for measurement of the pressure that occurs total elimination of intergranular porosity, join point (P_{join}), this result was confirmed by SEM.