

06C: Mass Transport from the Grain Boundary into the Pore

Assume a cubic grain structure.

Assume one spherical pore placed at each corner of the cube.

Derive an equation of the form given below that relates the shrinkage of the pore (the change in its volume) to the displacement of the grains towards each other, i.e. the following equation,

$$\frac{dv_p}{dz} = ?$$

Here v_p is the volume of the pore, and z is the total displacement of the grains towards one another.

Note that the above equation has units of $(\text{length})^2$. The right hand side must have the same units.