

CERAMIC AND COLLOIDAL PROCESSING - EXERCISES

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Exercises 11

1. What is the preferred shaping (forming) method for fabricating the following parts and why is the method better suited than others?
 - a spherical part of high quality (for example a hip prosthesis)
 - a multilayer capacitor (for example - barium titanate ceramic)
 - a toilet (porcelain)
 - a ceramic knife (in alumina simple geometric shape)
 - a static mixer (very complex shape)
 - a red brick
2. What is the disadvantage of an agglomerated (flocculated or coagulated) suspension for shaping a raw
3. What type of law as a function of time does the thickness of a slip-casting or filter-pressing part follow? What are the practical consequences? How long is necessary to form a thickness of 5 and 10 mm of an alumina slip by filter pressing with an overpressure of 10 bar ($K_p = 3 \cdot 10^{-16} \text{ m}^2$, $d_{sv} = 0.3 \text{ }\mu\text{m}$, $v_1 = 0.64$ $v_0 = 0.3$, $\eta = 3 \text{ mPa}\cdot\text{s}$),
4. What kind of commercial powder do we use for dry pressing in industry? How are these powders produced?
5. What are the steps in the manufacture of a ceramic part after shaping (forming) and before sintering? What are the problems that can be encountered in these steps and how can they be avoided?