

Questions and discussion 9

How do we remove the polymer from the green body? Alexis

Two steps prior sintering:

- Drying: to remove the water (or other solvent)
- Debinding: get rid of the polymers, antifoam, surfactant, ... those organic compounds can make up for 10 to 25% mass of the green body so it is important to remove them

Those steps are done by heating the sample in a very controlled way → subject of the next lecture.

How does the interaction between two different particles work? Meryem

Very similar than for same material, just the two potentials are asymmetric if they have the same sign. If the signs of the potential are different the two particles attract each other's. Be aware of the iep and pH value to determine the sign of the potential.

What is the role of the surfactant? Odelia

They decrease the surface energy of the liquid-solid interface (solvent-particle) which increases the wettability of the system (decrease the contact angle) Alexis and Remy

If the surfactant concentration increases too much it reaches the CMC and they start to form micelles. After the CMC the surface tension keeps decreasing with increasing surfactant concentration but much slower. Surfactants are always amphiphilic molecules.

How to decrease the surface tension without adding surfactant?

Adding salt → No

Apply pressure → No

Change particles roughness → changes the contact angle but not directly the surface tension

Answer: change the solvent with lower energy, not necessarily change the whole solvent but add some in the water for example.

Dishwater salt → je n'arrive pas à résumer la réponse de manière concise par écrit mais si il y a encore des incompréhensions je peux expliquer par oral

Origin of VdW interactions? Meryem

Short range interactions, bonding between solids not related to net charge (electrostatics interactions) but to electrons fluctuation (dipoles, induced dipoles, etc...)

+: Remy, Elias, Amandine, Dylan, Alexis, Odelia, Meryem