Question and discussion 2

How to determine which particle size measurement technique to use? *Patrick*

Depends on the size *Meryem*

TEM imaging *Patrick* → too expensive, works only for very small particles

Optical microscopy or SEM imaging allows to have an idea of the particle size and then decide the appropriate technique (PCS, laser diffraction, sedimentation, …) i.e. exercise 2.4

Example of material with narrow PSD and large PSD? *Meryem*

Depends mainly on the processing, processed material tends to have narrower PSD then natural one for example. The presence of agglomerate and aggregate can also influence, the dispersity of a PSD can be reduced to a certain extend by milling.

Why some particles are spherical and other not at all? (see slide 6 week 2) *Meryem*

Silica is amorphous *Dylan.* Amorphous material doesn't have preferential growth direction and therefore can have spherical shape (to reduce the surface energy). It is not the case for crystalline material such as Alumina with a faceted surface.

Are primary particles composed of one unique grain? *Aurelien*

Not always, it depends on the size of the particle, big particles are often multi domains (see gold particles slide 37 week 2, the different domains can be seen). If the TEM analysis and the XRD give the same particle size then the particle is composed of a unique grain.

What is the main limitation of most of the measuring techniques?

We assume spherical shape *Patrick*

What is needed to characterize a PSD? Exercise 2.2

A size (D_v50, mean, …) and the span of the distribution *Remy*

An image *Meryem*

The rest of the question are discussed in the Exercise 2