

CERAMIC AND COLLOIDAL PROCESSING - EXERCISES

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Exercises 2

1. What are the physical characteristics that can be used to describe a powder?
2. What are the 2 parameters that describe a distribution (of size) and what is the difference between the mode, the mean and the median of a distribution?
3. Calculate the diameters d_{ns} , d_{nv} , d_{sv} and d_{vm} for the distribution below, using a total number of particles 10^6 . Distribution by number

Cumulative Diameter (microns)	Cumulative % (less than)	Frequency Diameter (microns)	%Frequency (in each class)
4.0	100.0	3.75	0.4
3.5	99.6	3.0	4.1
2.5	95.5	2.175	10.3
1.85	85.2	1.675	13.6
1.5	71.6	1.35	17.3
1.2	54.3	1.125	9.2
1.05	45.1	0.975	12.3
0.9	32.8	0.825	12.4
0.75	20.4	0.675	9.0
0.6	11.4	0.55	5.1
0.5	6.3	0.425	3.9
0.35	2.4	0.175	2.4

Median diameter $d_{n50} = 1.12 \mu\text{m}$, $\sigma_{n50} = 0.55 \mu\text{m}$

4. How do you measure a size distribution of a powder,

i) From 25 to 1000 μm ii) $<10 \mu\text{m}$ iii) $<300 \text{ nm}$

What types of diameters are measured by these methods, briefly describe the method and what are the limitations of these methods?

5. How can we find an agglomeration factor, FAG, less than 1.