CERAMIC AND COLLOIDAL PROCESSING - EXERCISES

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Exercises 6

1. What are the main methods of classifying a powder?
   What are their advantages and disadvantages (limitations)?
   How to classify a powder with sizes between
   - 5000 to 50 μm
   - 50 to 5 μm
   - <10 μm
   - <100nm

2. What type of machine would you use to reduce the size of particle to the following dimensions:
   - to mm
   - alumina <100 μm
   - alumina <1 μm

3. What are the differences between wet milling and dry milling?

4. Could you describe a milling circuit?

5. Table 1 below shows the results of pure sand size reduction by a ball mill:

x (μm)	R (1h) %	R (5 h)	R (10 h)	R (15 h)	R (20 h)
2	97.5	92	81	75	78
3	96.5	88	75	68	75
4	95.5	83	72	61	73
5	95	81	69	55	70
10	92	70	44	35	60
20	88	55	18	27	50
30	81	45	7	10	40
40	77	30	3	0	0
50	72	20	0	0	0
100	60	1	0	0	0
200	20	0	0	0	0

R(h) = cumulative value of the amount of powder retained on the sieves (greater than cumulative distribution, e.g. Rosin-Rammler type distribution) for each of the of the sieves (h = hours of milling)
- How long does it take to reach the milling limit?
- Why is there a milling limit?
- How can we modify the milling limit?