

Sunday, February 7th, 2:30 pm

Dot counting

Nanoceramic, Day 2, image 10 Analysis

Every 10 dots, slash made

Dots (remain intact)

~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~ |||| = 240  
intact dots

$240 / 310 = 0.774 \Rightarrow 77.42\%$   
intact dots

average intact dot size is suspected  
to be smaller than popped dot size

Dots (appear popped)

~~||||~~ || = 70  
popped dots

$70 / 310 = 22.58\%$  popped dots

average popped dot size is suspected  
to be larger than intact dot size

Total counted: 310 dots (intact + popped)

Sizing  $\rightarrow$  my ruler

0.5 cm = 5 mm = 100  $\mu$ m (image dimension)

Dots (popped)

average = 85  $\mu$ m

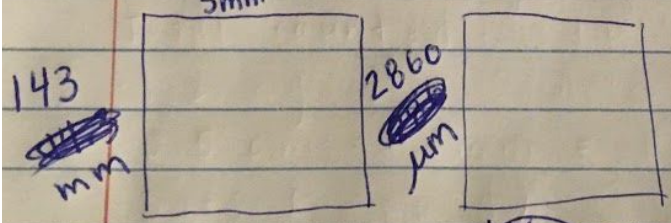
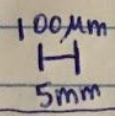
1	x3 mm	60 $\mu$ m	9	x2 mm	40 $\mu$ m
2	x4 mm	80 $\mu$ m	10	x4 mm	80 $\mu$ m
3	x6 mm	120 $\mu$ m	11	x5 mm	100 $\mu$ m
4	x4 mm	80 $\mu$ m	12	x5 mm	100 $\mu$ m
5	x5 mm	100 $\mu$ m	13	x6 mm	120 $\mu$ m
6	x6 mm	120 $\mu$ m	14	x4 mm	80 $\mu$ m
7	x2 mm	40 $\mu$ m	15	x3 mm	60 $\mu$ m
8	x4 mm	80 $\mu$ m	16	x5 mm	100 $\mu$ m

Dots (intaked)					
1	5 mm	100 $\mu\text{m}$	9	4 mm	80 $\mu\text{m}$
2	3 mm	60 $\mu\text{m}$	10	6 mm	120 $\mu\text{m}$
3	4 mm	80 $\mu\text{m}$	11	5.5 mm	110 $\mu\text{m}$
4	2 mm	40 $\mu\text{m}$	12	1.75 mm	35 $\mu\text{m}$
5	2 mm	40 $\mu\text{m}$	13	6 mm	120 $\mu\text{m}$
6	3 mm	60 $\mu\text{m}$	14	3 mm	60 $\mu\text{m}$
7	3.5 mm	70 $\mu\text{m}$	15	2 mm	40 $\mu\text{m}$
8	2.5 mm	50 $\mu\text{m}$	16	2 mm	40 $\mu\text{m}$

average = 69.0625  $\mu\text{m}$

Dots (popped) radius average = 42.5  $\mu\text{m}$   
 diameter average = 85  $\mu\text{m}$   
 circle area ( $\pi r^2$ ) = 0.00554  $\text{mm}^2$   
 = 5674.5  $\mu\text{m}^2$

Dots (intaked) diameter average = 69.0625  $\mu\text{m}$   
 radius average = 0.03453  $\text{mm}$  = 34.53  $\mu\text{m}$   
 circle area ( $\pi r^2$ ) = 3746.05  $\mu\text{m}^2$   
 = 0.003745  $\text{mm}^2$



5 mm = 100  $\mu\text{m}$   
 Area of rectangle =  $12 \times 836 / \mu\text{m}$   
 = 12,836,00  $\mu\text{m}^2$

Dots (popped):  $(5674.5) \times 70 = 397,215 \mu\text{m}^2$

Dots (intact):  $(3746.05) \times 240 = 899,052 \mu\text{m}^2$

Total Dot Occupied Area : Popped + Intaked = 1,296,267  $\mu\text{m}^2$

Dot Area =  $\frac{1,296,267}{12,836,00} = 0.10639 \Rightarrow 10.639\%$



100  $\mu$ m  
H

Mag = 24 X  
WD = 10.0 mm

EHT = 10.00 kV

Signal A = SE2  
Signal B = SE2

Date :27 Jan 2021

University  
of Idaho

Analysis conducted on this image, SEM Nanoceramic Day 2 File 10