



T.C.
İZMİR YÜKSEK TEKNOLOJİ ENSTİTÜSÜ
MÜHENDİSLİK FAKÜLTESİ
Kimya Mühendisliği Bölümü

İZMİR

Sayı:B.30.2.İYTE.0.17.14.00/60

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Zümre Metalürji San.Tic.Ltd.Şti tarafından kargo ile tarafımıza gönderilen üç adet kil bazlı olduğu belirtilen numunelere aşağıda belirtilen testler yapılmıştır.

Test 1: Dinamik ışık kırınımı yöntemiyle tane boyutu analizi

Test 2: Helyum piknometresi ile yoğunluk tayini

Test 3: UV-Vis spektrometre ile Işık soğurma analizi

Açıklamalar

Test1: herbir numune su içinde disperse edilerek analiz edilmiştir.

Test 2: herbir numuneden yaklaşık 2g kadar kullanılarak analiz edilmiştir.

Test 3: herbir numune 1.2 cm çapında ve 2mm kalınlığında preslenerek pelet haline getirilmiştir.

Sonuçlar:

Test 1:

Numune kodu 1: ortalama tane boyutunun 1000nm civarında olduğu ve dağılımın 750-1250nm aralığında olduğu tespit edilmiştir.

Numune kodu2: : ortalama tane boyutunun 1000nm civarında olduğu ve dağılımın 750-1250nm aralığında olduğu tespit edilmiştir

Numune kodu3: : ortalama tane boyutunun 1000nm civarında olduğu ve dağılımın 750-1350nm aralığında olduğu tespit edilmiştir

Test 2:

Numune kodu 1: numune için yoğunluk 2.7241g/cc olarak tespit edilmiştir

Numune kodu 2: numune için yoğunluk 2.7561g/cc olarak tespit edilmiştir

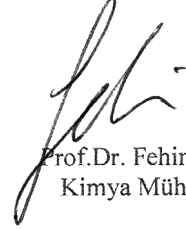
Numune kodu 3: numune için yoğunluk 2.7591g/cc olarak tespit edilmiştir

Test 3:

Numunelerin 250-800 nm dalgaboyu aralığında UV-VIS Diffuse Reflectance spektrumları görülmektedir. Bu analize ve spektrumlardan hesaplanan bant genişliği değerlerine göre üç örneğin de benzer optik soğurma davranışı gösterdiği gözlemlenmiştir.



Prof.Dr. Muhsin ÇİFTÇİOĞLU
Kimya Müh. Öğretim Üyesi



Prof.Dr. Fehime ÖZKAN
Kimya Müh. Böl.Bsk.V

İzmir Yüksek Teknoloji Enstitüsü
Kimya Mühendisliği Böl.
Tel: 0 232 750 66 00
Fax: 0 232 750 66 45

Ekler:

Ek1: tane boyut dağılımı analiz sonuçları.

Ek2: Işık soğurma analiz sonuçları.

Ek1.

Sample 1

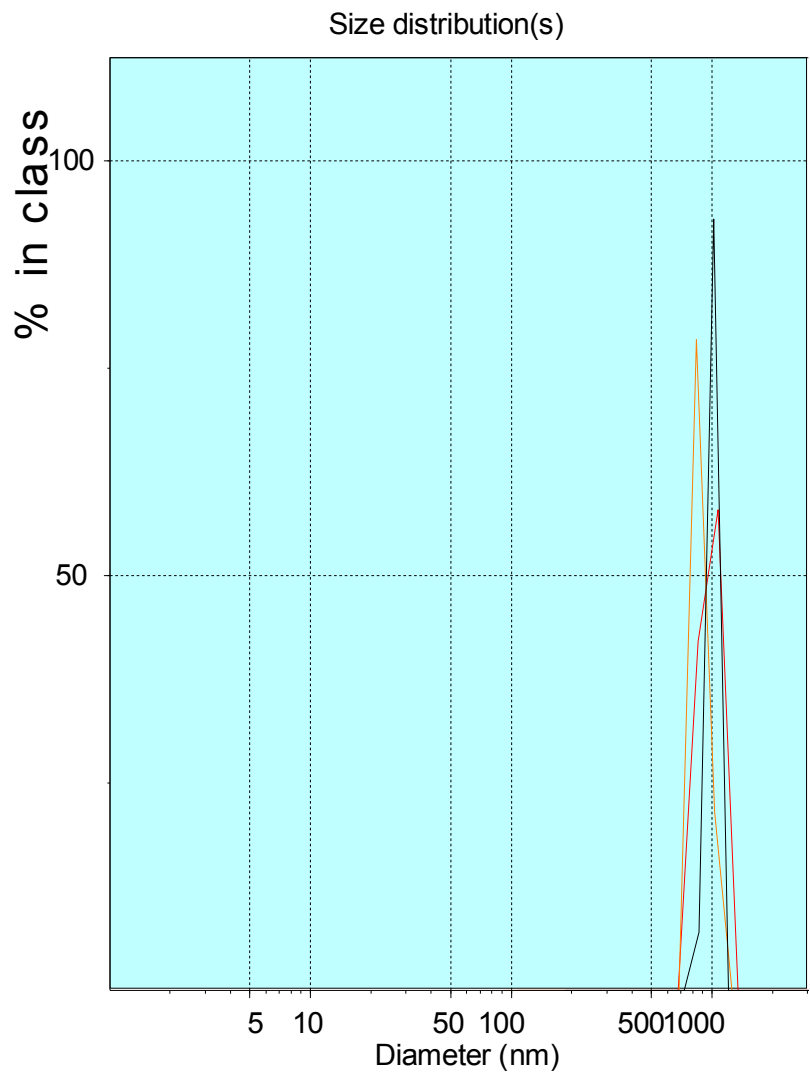
size(nm) Intensity Volume Number Peak Analysis by intensity

186.2	0.0	0.0	0.0	Peak	Area	Mean	Width
220.7	0.0	0.0	0.0	1	100.0	1008.8	180.8
261.6	0.0	0.0	0.0				
310.1	0.0	0.0	0.0	Peak Analysis by volume			
367.6	0.0	0.0	0.0				
435.7	0.0	0.0	0.0	Peak	Area	Mean	Width
516.5	0.0	0.0	0.0	1	100.0	1026.7	349.0
612.3	0.0	0.0	0.0				
725.8	0.0	0.1	0.2	Peak Analysis by number			
860.4	7.0	25.1	25.2				
1019.9	93.0	49.9	49.8	Peak	Area	Mean	Width
1209.0	0.0	24.9	24.8	1	100.0	1026.3	349.3
1433.2	0.0	0.0	0.0				
1698.9	0.0	0.0	0.0				
2013.9	0.0	0.0	0.0				
2387.3	0.0	0.0	0.0				
2829.9	0.0	0.0	0.0				
3354.6	0.0	0.0	0.0				
3976.6	0.0	0.0	0.0				
4713.9	0.0	0.0	0.0				
5587.9	0.0	0.0	0.0				
6624.0	0.0	0.0	0.0				
7852.1	0.0	0.0	0.0				
9308.0	0.0	0.0	0.0				

Size(nm) Intensity Volume Number Peak Analysis by intensity

92.8	0.0	0.0	0.0	Peak	Area	Mean	Width
113.3	0.0	0.0	0.0	1	100.0	879.3	204.3
138.4	0.0	0.0	0.0				
169.1	0.0	0.0	0.0	Peak Analysis by volume			
206.6	0.0	0.0	0.0				
252.4	0.0	0.0	0.0	Peak	Area	Mean	Width
308.4	0.0	0.0	0.0	1	100.0	1013.6	426.7
376.8	0.0	0.0	0.0				
460.3	0.0	0.0	0.0	Peak Analysis by number			
562.3	0.0	0.0	0.0				
687.0	0.0	2.9	4.9	Peak	Area	Mean	Width
839.2	78.5	27.9	29.9	1	100.0	999.0	435.6
1025.3	21.5	47.1	45.1				
1252.6	0.0	22.1	20.1				
1530.2	0.0	0.0	0.0				
1869.4	0.0	0.0	0.0				
2283.8	0.0	0.0	0.0				
2790.1	0.0	0.0	0.0				
3408.6	0.0	0.0	0.0				
4164.2	0.0	0.0	0.0				
5087.4	0.0	0.0	0.0				
6215.1	0.0	0.0	0.0				
7592.9	0.0	0.0	0.0				
9276.0	0.0	0.0	0.0				

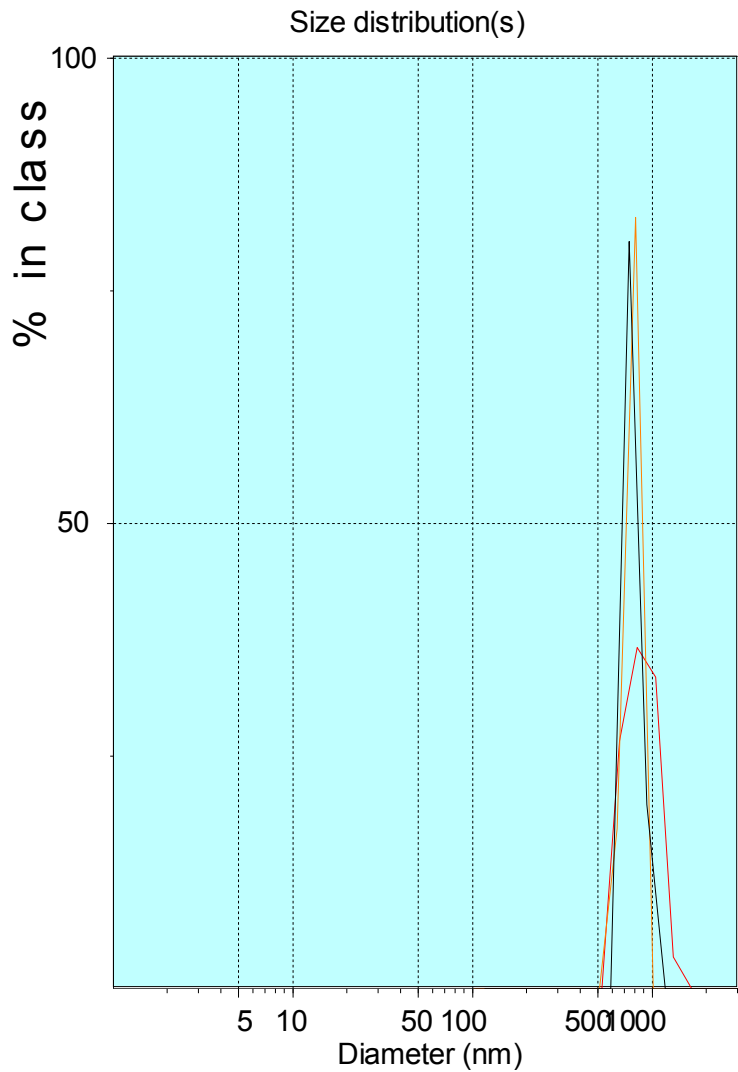
Size(nm)	Intensity	Volume	Number	Peak Analysis by intensity			
106.9	0.0	0.0	0.0	Peak	Area	Mean	Width
134.6	0.0	0.0	0.0	1	100.0	977.6	413.2
169.5	0.0	0.0	0.0				
213.4	0.0	0.0	0.0	Peak Analysis by volume			
268.7	0.0	0.0	0.0				
338.3	0.0	0.0	0.0	Peak	Area	Mean	Width
425.9	0.0	0.0	0.0	1	100.0	1073.0	503.8
536.2	0.0	0.0	0.0				
675.1	0.0	1.3	2.4	Peak Analysis by number			
850.0	42.1	26.3	27.4				
1070.2	57.9	48.7	47.6	Peak	Area	Mean	Width
1347.4	0.0	23.7	22.6	1	100.0	1062.8	509.5
1696.5	0.0	0.0	0.0				
2136.0	0.0	0.0	0.0				
2689.3	0.0	0.0	0.0				
3385.9	0.0	0.0	0.0				
4263.0	0.0	0.0	0.0				
5367.3	0.0	0.0	0.0				
6757.7	0.0	0.0	0.0				
8508.3	0.0	0.0	0.0				
10712.3	0.0	0.0	0.0				
13487.3	0.0	0.0	0.0				
16981.1	0.0	0.0	0.0				
21379.9	0.0	0.0	0.0				



Sample2	Intensity	Volume	Number	Peak	Area	Mean	Width
Size(nm)							
104.3	0.0	0.0	0.0	Peak			
131.3	0.0	0.0	0.0	1	100.0	872.0	563.3
165.3	0.0	0.0	0.0				
208.2	0.0	0.0	0.0	Peak Analysis by volume			
262.1	0.0	0.0	0.0				
330.0	0.0	0.0	0.0	Peak			
415.5	0.0	0.0	0.0	1	100.0	1057.5	487.4
523.1	0.0	0.1	0.2				
658.6	26.6	0.2	0.6	Peak Analysis by number			
829.3	36.7	25.0	25.1				
1044.1	33.4	49.7	49.4	Peak			
1314.6	3.4	25.0	24.7	1	100.0	1054.0	488.0
1655.1	0.0	0.1	0.0				
2083.9	0.0	0.0	0.0				
2623.7	0.0	0.0	0.0				
3303.4	0.0	0.0	0.0				
4159.1	0.0	0.0	0.0				
5236.6	0.0	0.0	0.0				
6593.1	0.0	0.0	0.0				
8301.1	0.0	0.0	0.0				
10451.6	0.0	0.0	0.0				
13159.1	0.0	0.0	0.0				
16568.1	0.0	0.0	0.0				
20860.1	0.0	0.0	0.0				

Sample2	Intensity	Volume	Number	Peak	Area	Mean	Width
Size(nm)							
101.7	0.0	0.0	0.0	Peak			
128.0	0.0	0.0	0.0	1	100.0	779.9	209.6
161.2	0.0	0.0	0.0				
202.9	0.0	0.0	0.0	Peak Analysis by volume			
255.5	0.0	0.0	0.0				
321.7	0.0	0.0	0.0	Peak			
405.0	0.0	0.0	0.0	1	100.0	804.7	383.8
509.9	0.0	2.2	4.0				
642.1	17.1	27.2	29.0	Peak Analysis by number			
808.4	82.9	47.8	46.0				
1017.8	0.0	22.8	21.0	Peak			
1281.5	0.0	0.0	0.0	1	100.0	792.5	390.6
1613.5	0.0	0.0	0.0				
2031.6	0.0	0.0	0.0				
2557.9	0.0	0.0	0.0				
3220.6	0.0	0.0	0.0				
4055.0	0.0	0.0	0.0				
5105.5	0.0	0.0	0.0				
6428.3	0.0	0.0	0.0				
8093.7	0.0	0.0	0.0				
10190.5	0.0	0.0	0.0				
12830.7	0.0	0.0	0.0				
16154.8	0.0	0.0	0.0				
20340.1	0.0	0.0	0.0				

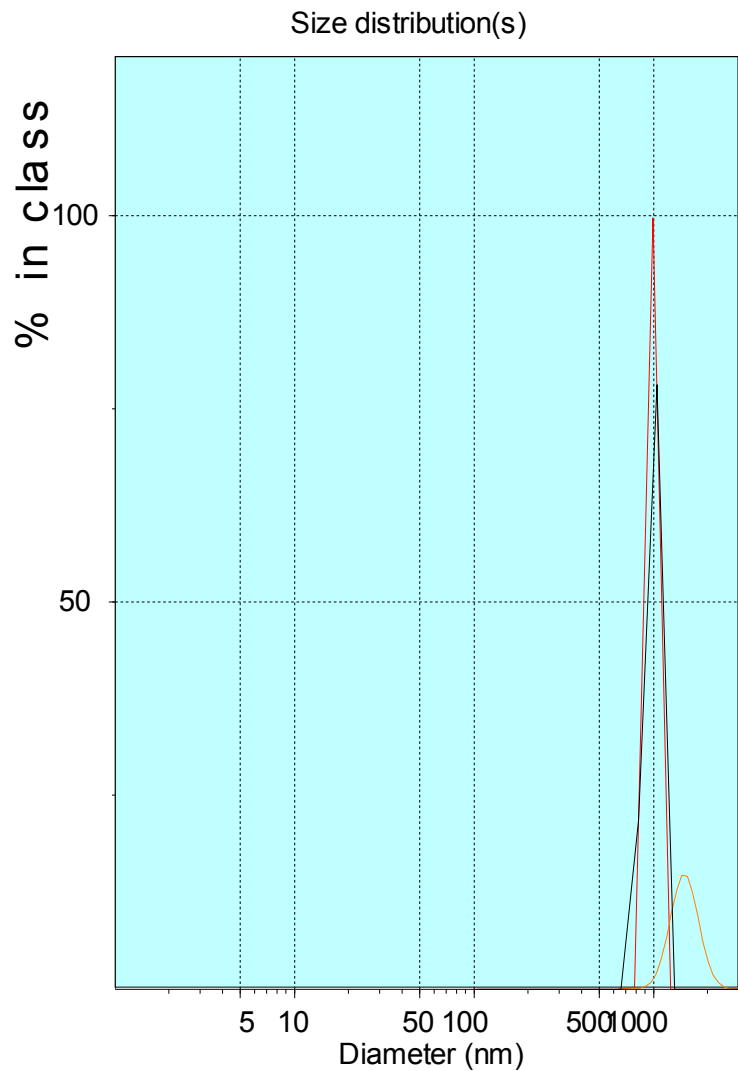
Size(nm)		Intensity	Volume	Number	Peak Analysis by intensity			
117.6	0.0	0.0	0.0	Peak	Area	Mean	Width	
148.1	0.0	0.0	0.0	1	100.0	780.9	204.1	
186.5	0.0	0.0	0.0					
234.8	0.0	0.0	0.0	Peak Analysis by volume				
295.6	0.0	0.0	0.0					
372.2	0.0	0.0	0.0	Peak	Area	Mean	Width	
468.6	0.0	0.0	0.0	1	100.0	752.7	345.3	
590.0	0.0	25.0	25.0					
742.8	80.2	50.0	50.0	Peak Analysis by number				
935.2	19.8	25.0	25.0					
1177.4	0.0	0.0	0.0	Peak	Area	Mean	Width	
1482.4	0.0	0.0	0.0	1	100.0	752.7	345.3	
1866.4	0.0	0.0	0.0					
2349.9	0.0	0.0	0.0					
2958.6	0.0	0.0	0.0					
3725.0	0.0	0.0	0.0					
4689.9	0.0	0.0	0.0					
5904.8	0.0	0.0	0.0					
7434.4	0.0	0.0	0.0					
9360.1	0.0	0.0	0.0					
11784.8	0.0	0.0	0.0					
14837.5	0.0	0.0	0.0					
18680.9	0.0	0.0	0.0					
23519.9	0.0	0.0	0.0					



Sample3		Intensity Volume Number Peak Analysis by intensity						
Size(nm)		Intensity	Volume	Number	Peak	Area	Mean	Width
104.2	0.0	0.0	0.0		Peak			
131.1	0.0	0.0	0.0	1	100.0	996.1	283.8	
165.1	0.0	0.0	0.0					
207.9	0.0	0.0	0.0		Peak Analysis by volume			
261.8	0.0	0.0	0.0					
329.6	0.0	0.0	0.0	Peak	Area	Mean	Width	
415.0	0.0	0.0	0.0	1	100.0	1056.6	484.9	
522.5	0.0	0.0	0.0					
657.8	0.0	0.0	0.0		Peak Analysis by number			
828.3	21.8	25.0	25.0					
1042.8	78.2	50.0	50.0	Peak	Area	Mean	Width	
1313.0	0.0	25.0	25.0	1	100.0	1056.4	484.9	
1653.2	0.0	0.0	0.0					
2081.5	0.0	0.0	0.0					
2620.8	0.0	0.0	0.0					
3299.7	0.0	0.0	0.0					
4154.6	0.0	0.0	0.0					
5231.0	0.0	0.0	0.0					
6586.2	0.0	0.0	0.0					
8292.6	0.0	0.0	0.0					
10441.0	0.0	0.0	0.0					
13146.0	0.0	0.0	0.0					
16551.8	0.0	0.0	0.0					
20839.9	0.0	0.0	0.0					

Size(nm)		Intensity Volume Number Peak Analysis by intensity						
Intensity	Volume	Number	Peak	Area	Mean	Width		
644.9	0.0	0.0	0.0	Peak	Area	Mean	Width	
689.7	0.0	0.1	0.4	1	100.0	1510.3	643.7	
737.5	0.0	0.1	0.8					
788.7	0.0	0.1	0.4		Peak Analysis by volume			
843.5	0.1	0.0	0.0					
902.0	0.3	0.0	0.1	Peak	Area	Mean	Width	
964.6	0.8	1.2	3.0	1	5.1	1048.2	155.7	
1031.5	1.9	2.4	6.1	2	59.4	1377.6	196.6	
1103.1	3.8	1.5	3.5	3	35.3	1680.4	123.2	
1179.7	6.5	0.5	0.8					
1261.6	9.8	13.9	15.7		Peak Analysis by number			
1349.1	12.9	27.2	30.5					
1442.8	14.7	14.3	15.8	Peak	Area	Mean	Width	
1542.9	14.5	9.3	5.9	1	1.6	740.2	100.4	
1650.0	12.6	17.3	10.6	2	12.6	1043.0	150.6	
1764.5	9.4	9.2	5.5	3	64.3	1365.4	188.9	
1887.0	6.2	1.2	0.5	4	21.6	1665.6	119.7	
2017.9	3.5	0.9	0.3					
2158.0	1.7	0.4	0.1					
2307.8	0.7	0.2	0.1					
2467.9	0.3	0.1	0.0					
2639.2	0.1	0.0	0.0					
2822.4	0.0	0.0	0.0					
3018.3	0.0	0.0	0.0					

Size(nm)	Intensity	Volume	Number	Peak Analysis by intensity			
99.2	0.0	0.0	0.0	Peak	Area	Mean	Width
124.8	0.0	0.0	0.0	1	100.0	992.2	230.9
157.2	0.0	0.0	0.0				
197.9	0.0	0.0	0.0	Peak Analysis by volume			
249.2	0.0	0.0	0.0				
313.7	0.0	0.0	0.0	Peak	Area	Mean	Width
395.0	0.0	0.0	0.0	1	100.0	1005.5	461.6
497.4	0.0	0.0	0.0				
626.2	0.0	0.0	0.1	Peak Analysis by number			
788.4	0.2	25.0	25.1				
992.7	99.8	50.0	49.9	Peak	Area	Mean	Width
1249.8	0.0	25.0	24.9	1	100.0	1005.2	461.8
1573.6	0.0	0.0	0.0				
1981.3	0.0	0.0	0.0				
2494.5	0.0	0.0	0.0				
3140.8	0.0	0.0	0.0				
3954.4	0.0	0.0	0.0				
4978.8	0.0	0.0	0.0				
6268.7	0.0	0.0	0.0				
7892.6	0.0	0.0	0.0				
9937.3	0.0	0.0	0.0				
12511.7	0.0	0.0	0.0				
15753.0	0.0	0.0	0.0				
19833.9	0.0	0.0	0.0				



Ek2.

