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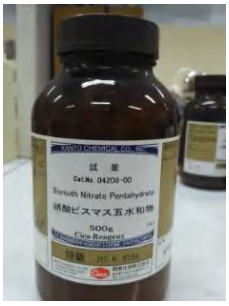
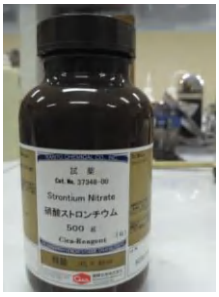
LAMPIRAN

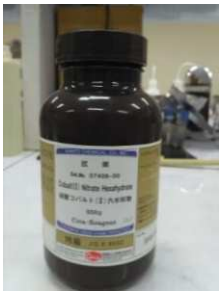
A. Bahan yang digunakan



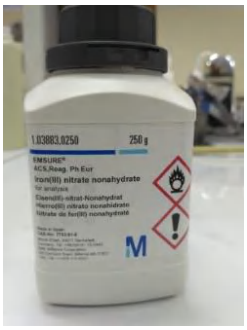
(a)



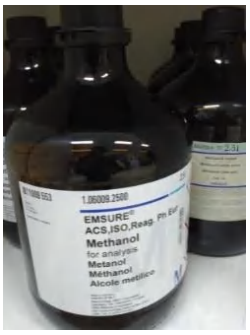
(b)



(c)



(d)



(e)

Gambar (a) $Bi(NO_3)_3.5H_2O$, (b) $Sr(NO_3)_2$, (c) $Co(NO_3)_2.6H_2O$, (d) $Fe(NO_3)_3.9H_2O$, (e) Metanol *for analysis*

B. Alat yang digunakan

(1)

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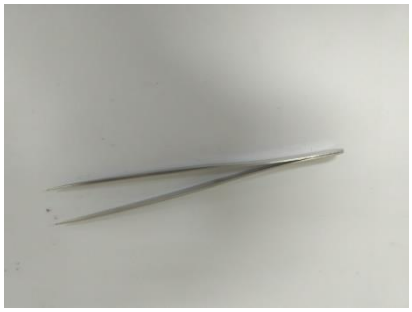
(22)

(23)

(24)



(25)

(26)

Gambar (1) Timbangan digital, (2) Gelas *beaker*, (3) Spatula, (4) Bola Zirkonia, (5) Jar Zirkonia, (6) *Deks Top Ball Mill*, (7) *Oven*, (8) Krusibel, (9) *Mortar* dan *pestle*, (10) Amplas, (11) *Furnace*, (12) Saringan, (13) *Silica* wol, (14) Silinder besi, (15) *Pyrometer*, (16) Pilox, (17) Benang, (18) Kain serbek, (19) Mikrometer sekrup , (20) Jangka sorong, (21) Penggaris, (22) *Hot plate*, (23) Molding, (24) Aluminium foil, (25) Pinset, (26) Mesin kompaksi

C. Data XRD

C.1 BiSCF-D Ori

No.	2-theta (deg)	d (ang.)	Height (cps)	FWHM (deg)	Int. I (cps deg)	Size (ang.)
1	16.3(2)	5.45(8)	50(14)	2.7(4)	224(74)	31(5)
2	22.667(13)	3.920(2)	541(47)	0.166(14)	132(5)	510(43)
3	28.03(4)	3.181(5)	52(14)	0.7(2)	79(12)	115(30)
4	32.227(4)	2.7754(3)	4081(128)	0.187(3)	1004(7)	461(7)
5	35.72(10)	2.512(7)	53(15)	0.25(16)	22(5)	355(230)
6	39.752(12)	2.2657(7)	563(47)	0.177(14)	140(4)	498(39)
7	46.260(10)	1.9610(4)	888(60)	0.232(13)	306(6)	389(21)
8	52.12(3)	1.7534(10)	112(21)	0.31(9)	69(6)	298(83)
9	57.480(9)	1.6020(2)	868(59)	0.248(11)	283(6)	382(16)
10	64.46(3)	1.4444(7)	30(11)	0.13(8)	4(3)	772(477)
11	67.43(3)	1.3878(5)	282(34)	0.32(3)	119(6)	313(30)
12	72.205(2)	1.30729(4)	154(25)	0.015(10)	3.4(15)	6639(4319)
13	76.832(13)	1.23969(17)	190(28)	0.30(3)	74(6)	359(36)
14	77.40(3)	1.2321(4)	33(11)	0.14(7)	5(3)	778(413)
15	81.44(4)	1.1807(5)	34(12)	0.32(14)	13(6)	342(155)
16	85.58(4)	1.1339(4)	56(15)	0.37(12)	31(7)	310(99)

C.2 BiSCF-D nano 20:1

No.	2-theta (deg)	d (ang.)	Height (cps)	FWHM (deg)	Int. I (cps deg)	Size (ang.)
1	22.617(16)	3.928(3)	373(39)	0.188(14)	89(5)	449(34)
2	27.260(15)	3.2687(17)	239(31)	0.13(3)	57(4)	668(182)
3	32.179(4)	2.7794(4)	3754(123)	0.183(3)	932(7)	472(8)
4	38.04(6)	2.363(4)	80(18)	0.19(5)	16(4)	462(114)
5	39.684(12)	2.2694(6)	533(46)	0.147(16)	112(5)	601(67)
6	44.711(11)	2.0252(5)	126(22)	0.10(2)	19(2)	903(181)
7	46.198(7)	1.9634(3)	778(56)	0.184(12)	249(6)	491(32)
8	52.077(17)	1.7548(5)	172(26)	0.11(2)	35(3)	811(158)
9	57.432(9)	1.6032(2)	760(55)	0.275(11)	278(5)	344(14)
10	67.33(4)	1.3895(8)	213(29)	0.39(4)	103(6)	255(25)
11	76.708(18)	1.2414(2)	205(29)	0.25(3)	94(5)	425(53)

C.3 BiSCF-D nano 15:1

No.	2-theta (deg)	d (ang.)	Height (cps)	FWHM (deg)	Int. I (cps deg)	Size (ang.)
1	14.910(16)	5.937(6)	88(19)	0.23(8)	41(4)	360(118)
2	15.90(2)	5.569(8)	116(22)	0.20(5)	43(4)	417(112)
3	22.627(4)	3.9265(7)	430(41)	0.198(12)	115(4)	428(26)
4	27.19(4)	3.277(5)	86(19)	0.47(9)	84(7)	180(35)
5	32.142(4)	2.7826(4)	3749(122)	0.192(3)	982(7)	450(7)
6	39.649(16)	2.2713(9)	508(45)	0.189(14)	127(5)	468(36)
7	46.159(7)	1.9650(3)	813(57)	0.192(13)	278(6)	471(31)
8	52.05(2)	1.7555(7)	80(18)	0.32(10)	37(5)	288(88)
9	57.367(12)	1.6049(3)	793(56)	0.261(13)	281(6)	362(18)
10	67.274(10)	1.39060(18)	215(29)	0.37(3)	93(6)	267(22)
11	76.64(4)	1.2423(5)	141(24)	0.41(5)	77(6)	259(31)

C.4 BiSCF-D nano 10:1

No.	2-theta	d	Height	FWHM	Int. I	Size
	(deg)	(ang.)	(cps)	(deg)	(cps deg)	(ang.)
1	14.93(3)	5.930(13)	97(20)	0.18(6)	34(4)	462(165)
2	22.605(16)	3.930(3)	452(43)	0.178(19)	115(5)	476(51)
3	27.18(2)	3.278(3)	89(19)	0.40(10)	76(7)	211(50)
4	32.144(4)	2.7824(4)	3673(121)	0.200(3)	967(7)	432(6)
5	39.661(10)	2.2707(5)	579(48)	0.145(15)	128(4)	607(63)
6	46.174(7)	1.9644(3)	816(57)	0.184(12)	274(5)	491(32)
7	51.963(16)	1.7583(5)	113(21)	0.23(6)	46(4)	397(107)
8	57.380(10)	1.6045(3)	780(56)	0.266(12)	281(5)	355(16)
9	67.257(9)	1.39092(17)	239(31)	0.33(3)	92(6)	306(26)
10	76.63(2)	1.2424(3)	222(30)	0.20(3)	75(5)	529(80)

C.5 Crytallite Size

C.5.1 Metode Scherrer

BiSCF-D	FWHM	FWHM (rad)	2theta (degree)	Theta (degree)	Theta (rad)	Cos theta (rad)	K	λ	L (Amstrong)	L (nm)
Ori	0.201	0.00351	32.3049	16.15245	0.281771	0.96056	0.9	1.541862	412.0104	41.2010438
20:01	0.2251	0.00393	32.2026	16.1013	0.280878	0.96081	0.9	1.541862	367.8043	36.7804293
15:01	0.2187	0.00382	32.1439	16.07195	0.280366	0.96095	0.9	1.541862	378.5118	37.85117944
10:01	0.2155	0.00376	32.1453	16.07265	0.280378	0.96095	0.9	1.541862	384.1337	38.41337379

C.5.2 Metode Williamson-Hall

a. BiSCF-D ori

2 theta (degree)	theta (degree)	Theta (rad)	sin theta (rad)	dhkl	B exp (degree)	B exp (rad)	Bexp $(rad)^2$	B instr (rad)	Bin $(rad)^2$	B^2 (rad)	B (rad)	cos theta (rad)	B (rad)cos theta(rad)
32.30490	16.15245	0.28177	0.27806	1 1 0	0.20100	0.00351	0.00001229	0.00090	0.00000081	0.00001150	0.00339	0.96056	0.00326
39.84330	19.92165	0.34752	0.34057	1 1 1	0.20100	0.00351	0.00001229	0.00110	0.00000121	0.00001110	0.00333	0.94022	0.00313
46.21840	23.10920	0.40313	0.39230	0 0 2	0.20100	0.00351	0.00001229	0.00120	0.00000144	0.00001090	0.00329	0.91984	0.00303
57.62020	28.81010	0.50258	0.48168	1 1 2	0.20100	0.00351	0.00001229	0.00090	0.00000081	0.00001150	0.00339	0.87634	0.00297
67.62450	33.81225	0.58984	0.55622	0 2 2	0.20100	0.00351	0.00001229	0.00110	0.00000121	0.00001110	0.00333	0.83103	0.00277

b. BiSCF-D nano 20:1

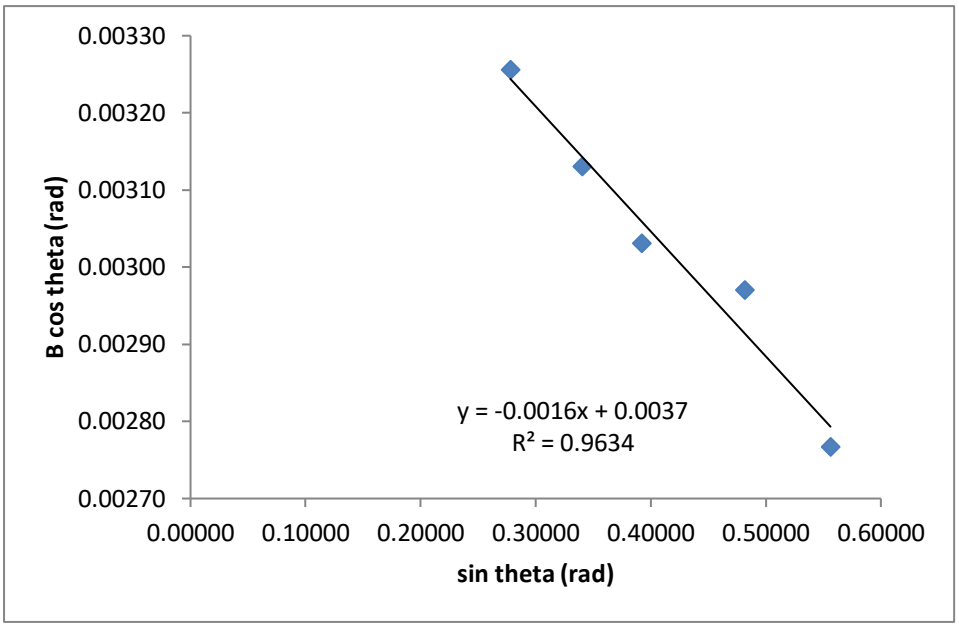
2 theta (degree)	Theta (degree)	Theta (rad)	sin theta (rad)	dhkl	B exp (degree)	B exp (rad)	Bexp $(rad)^2$	B instr (rad)	Bin $(rad)^2$	B^2 (rad)	B (rad)	cos theta (rad)	B(rad)cos theta(rad)
32.20260	16.10130	0.28088	1.10880	1 1 0	0.22510	0.00393	0.00002	0.00090	0.00000081	0.00001461	0.00382	0.96081	0.00367
39.71810	19.85905	0.34643	0.33954	1 1 1	0.22510	0.00393	0.00002	0.00110	0.00000121	0.00001421	0.00377	0.94059	0.00355
46.19400	23.09700	0.40291	0.39210	0 0 2	0.22510	0.00393	0.00002	0.00120	0.00000144	0.00001398	0.00374	0.91992	0.00344
57.43570	28.71785	0.50097	0.48027	1 1 2	0.22510	0.00393	0.00002	0.00090	0.00000081	0.00001461	0.00382	0.87712	0.00335
67.40230	33.70115	0.58790	0.55461	0 2 2	0.22510	0.00393	0.00002	0.00110	0.00000121	0.00001421	0.00377	0.83211	0.00314

c. BiSCF-D nano 15:1

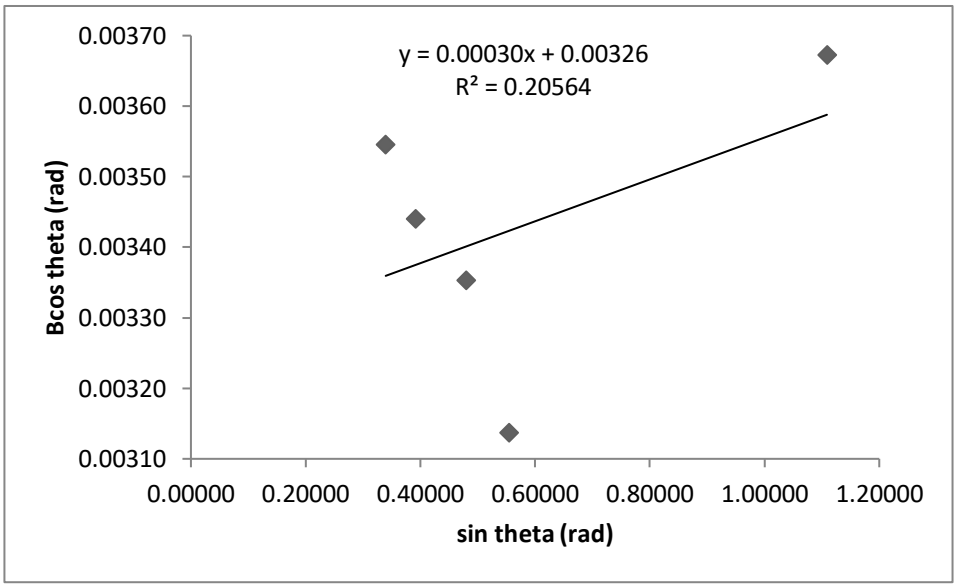
2 theta (degree)	Theta (degree)	theta (rad)	sin theta (rad)	dhkl	B exp (degree)	B exp (rad)	Bexp (rad)^2	B instr (rad)	Bin (rad)^2	B^2 (rad)	B (rad)	cos theta (rad)	B(rad)cos theta(rad)
32.14390	16.07195	0.28037	0.27671	1 1 0	0.21870	0.00382	0.00001	0.00090	0.00000081	0.00001374	0.00371	0.96095	0.00356
39.65270	19.82635	0.34586	0.33901	1 1 1	0.21870	0.00382	0.00001	0.00110	0.00000121	0.00001334	0.00365	0.94078	0.00344
46.12260	23.06130	0.40229	0.39153	0 0 2	0.21870	0.00382	0.00001	0.00120	0.00000144	0.00001311	0.00362	0.92017	0.00333
57.35320	28.67660	0.50025	0.47964	1 1 2	0.21870	0.00382	0.00001	0.00090	0.00000081	0.00001374	0.00371	0.87746	0.00325
67.30880	33.65440	0.58708	0.55393	0 2 2	0.21870	0.00382	0.00001	0.00110	0.00000121	0.00001334	0.00365	0.83256	0.00304

d. BiSCF-D nano 10:1

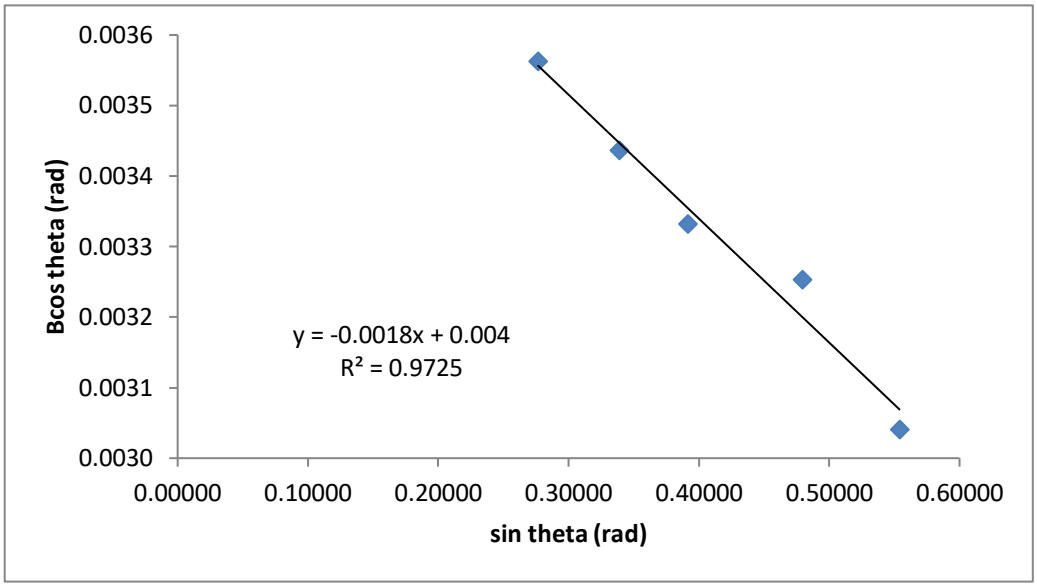
2 theta (degree)	Theta (degree)	theta (rad)	sin theta (rad)	dhkl	B exp (degree)	B exp (rad)	Bexp (rad)^2	B instr (rad)	Bin (rad)^2	B^2 (rad)	B (rad)	cos theta (rad)	B(rad)cos theta(rad)
32.14530	16.07265	0.28038	0.27672	1 1 0	0.21550	0.00376	0.00001	0.00090	0.00000081	0.00001332	0.00365	0.96095	0.00351
39.65680	19.82840	0.34590	0.33904	1 1 1	0.21550	0.00376	0.00001	0.00110	0.00000121	0.00001292	0.00359	0.94077	0.00338
46.12900	23.06450	0.40235	0.39158	0 0 2	0.21550	0.00376	0.00001	0.00120	0.00000144	0.00001269	0.00356	0.92014	0.00328
57.36400	28.68200	0.50034	0.47973	1 1 2	0.21550	0.00376	0.00001	0.00090	0.00000081	0.00001332	0.00365	0.87742	0.00320
67.32390	33.66195	0.58721	0.55404	0 2 2	0.21550	0.00376	0.00001	0.00110	0.00000121	0.00001292	0.00359	0.83249	0.00299



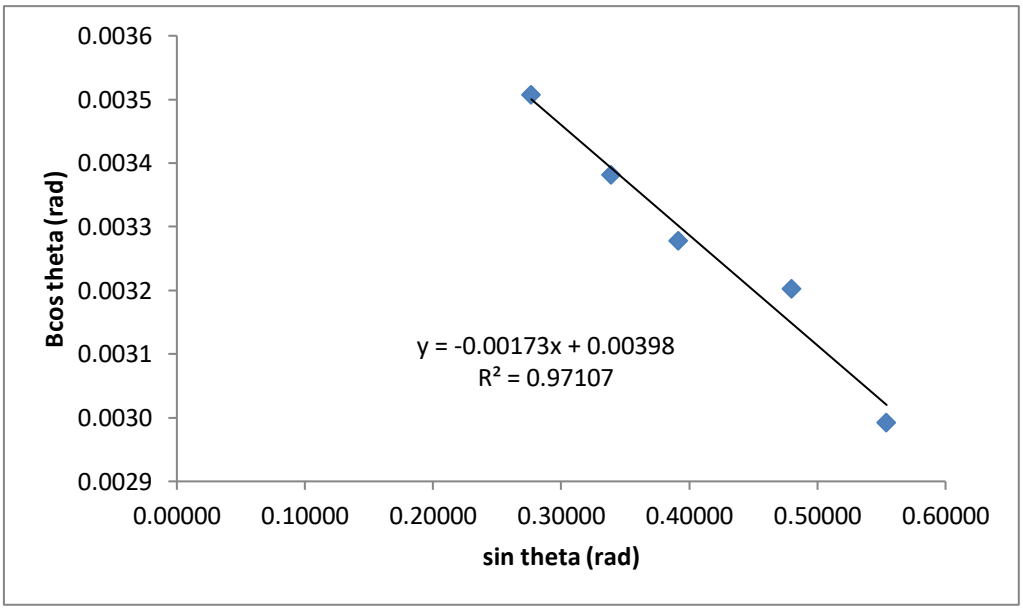
(a)



(b)



(c)



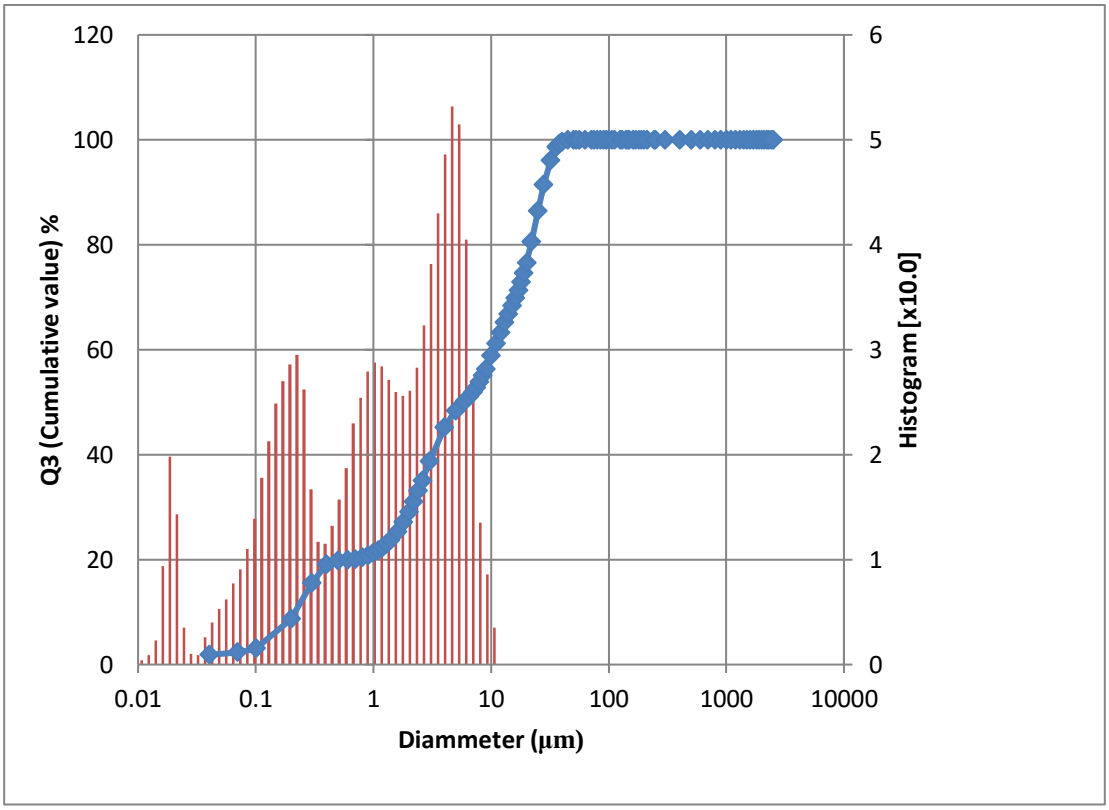
(d)

Gambar grafik penentuan crystallite size metode Williamson-Hall

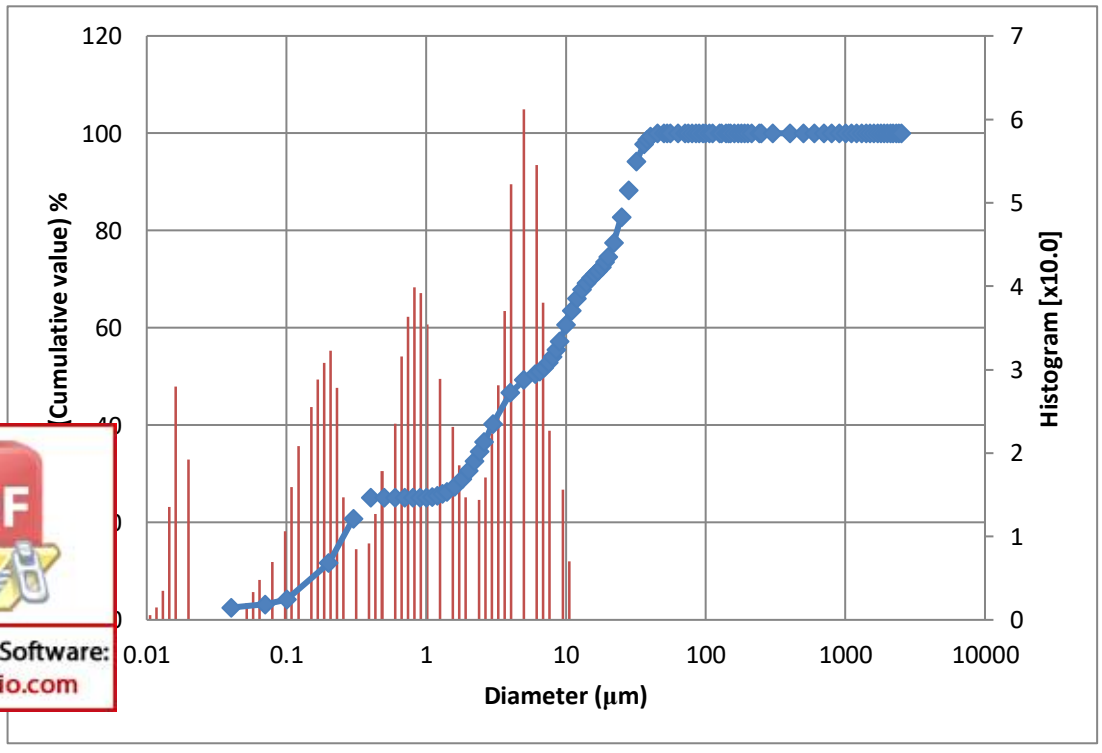
D. Data PSA (*Particle Size Analyzer*) mikro

D.1 BiSCF-D ori

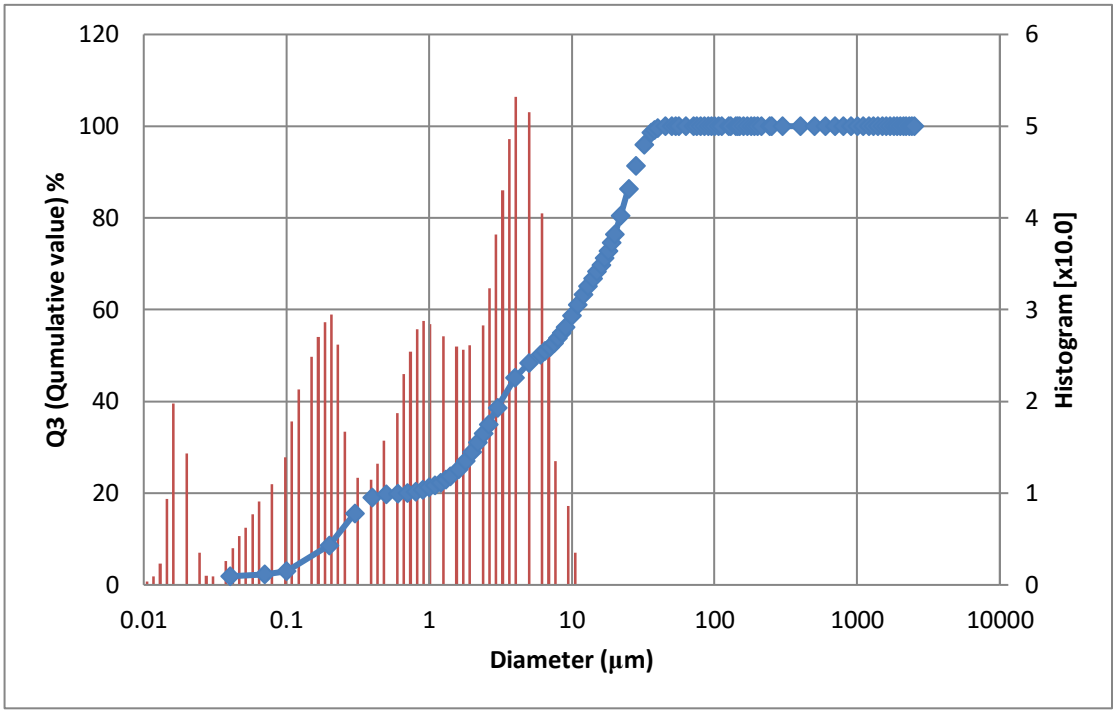
$D_{rata\text{-}rata}$: 10.56 mikron



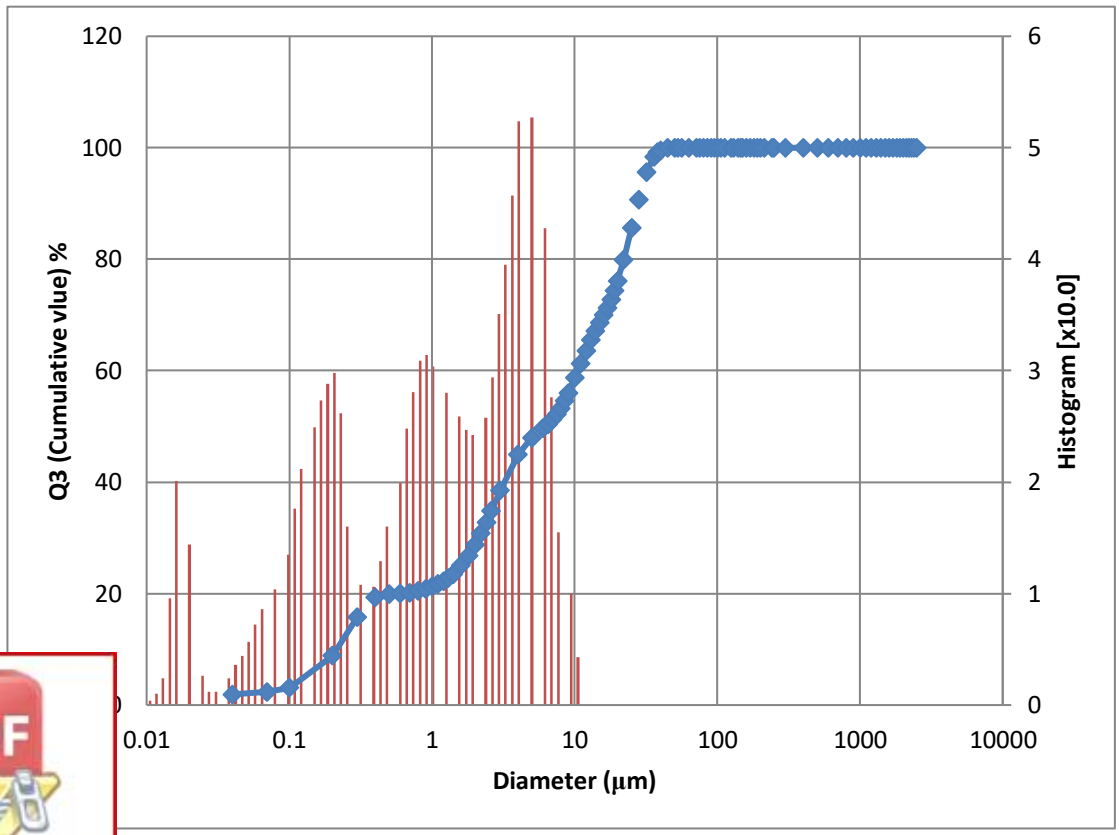
$D_{rata\text{-}rata}$: 10.74 mikron



$D_{rata\text{-}rata}$: 10.56 mikron

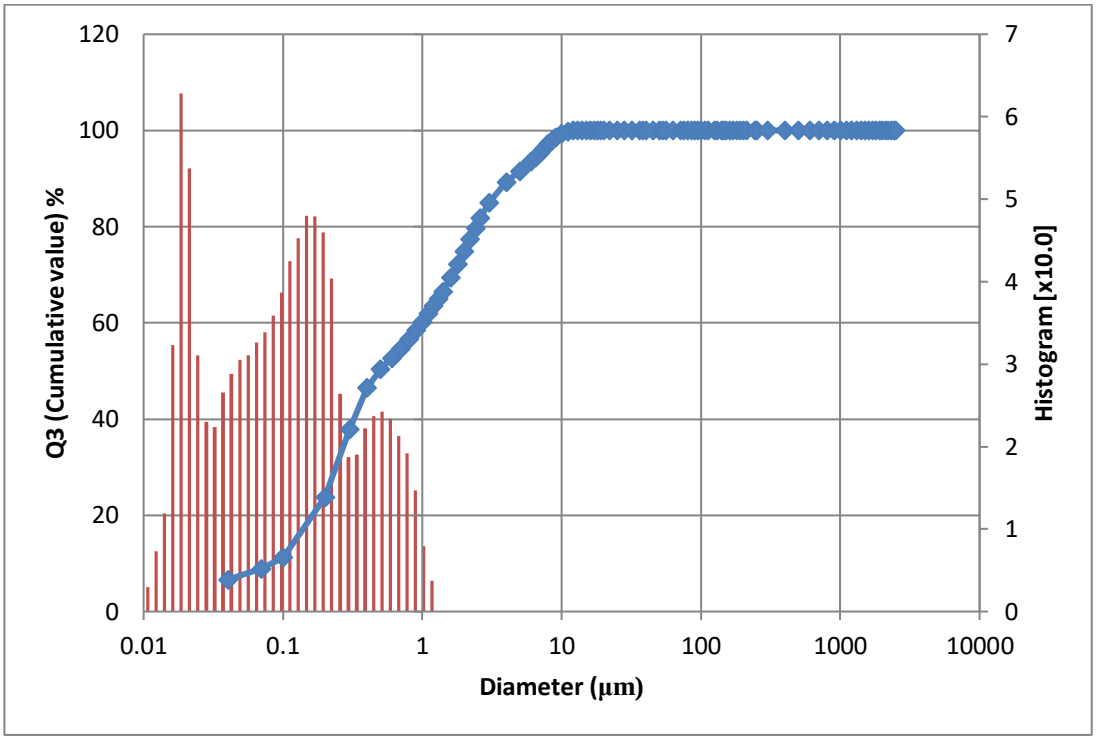


$D_{rata\text{-}rata}$: 10.68 mikron

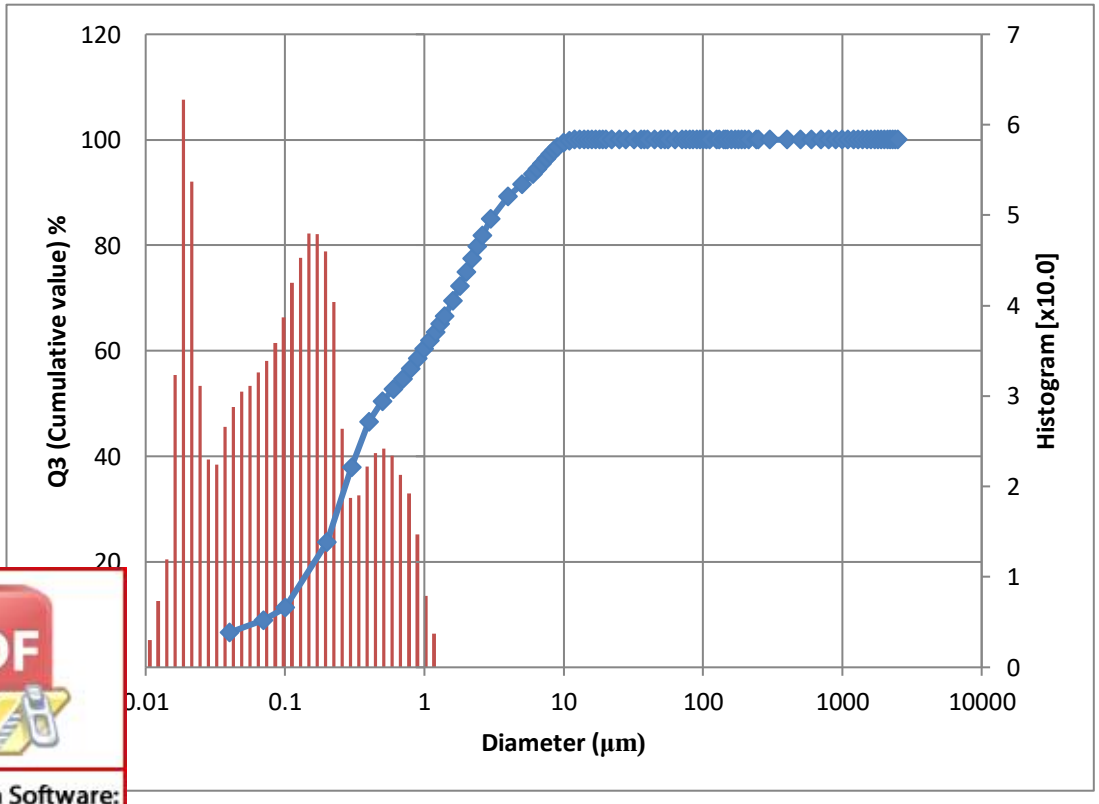


D.2 BiSCF-D nano 20:1

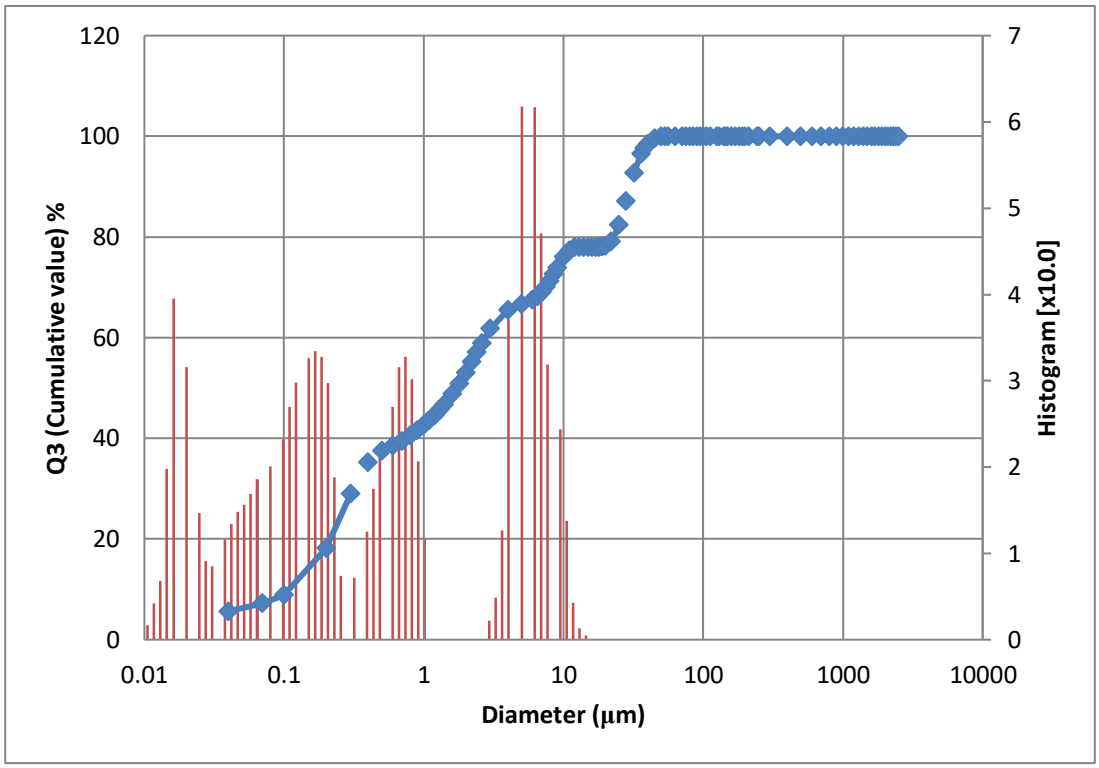
$D_{rata\text{-}rata}$: 1.52 mikron



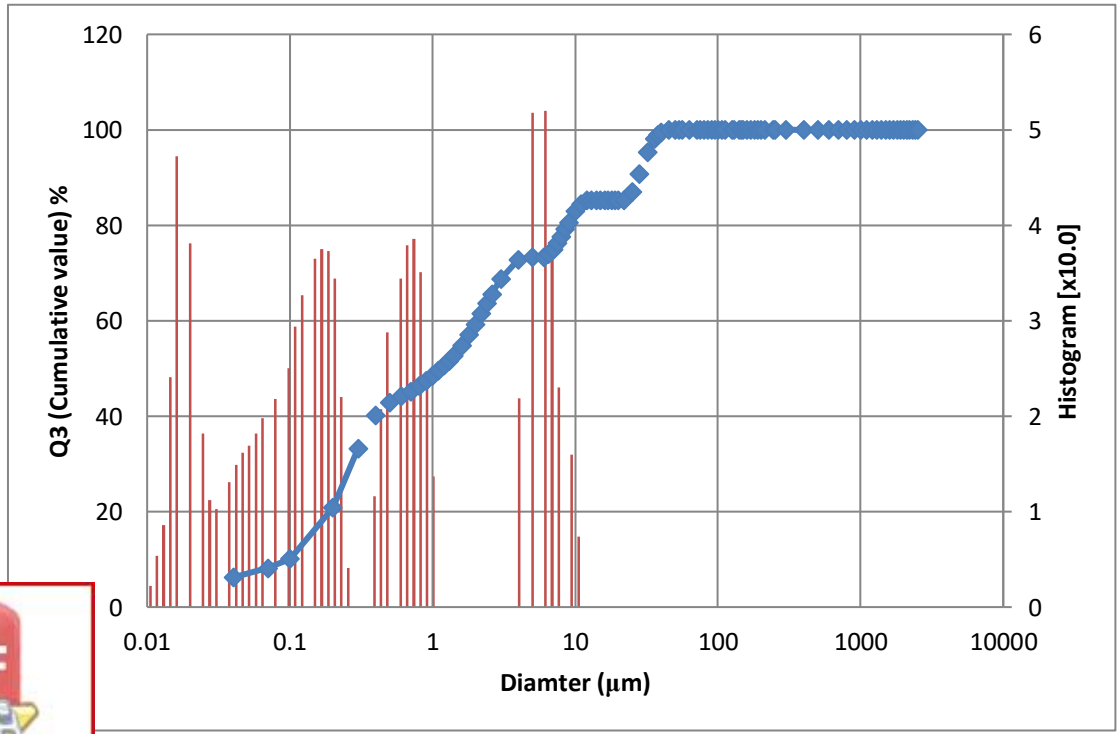
$D_{rata\text{-}rata}$: 1.52 mikron



$D_{rata\text{-}rata}$: 8.25 mikron

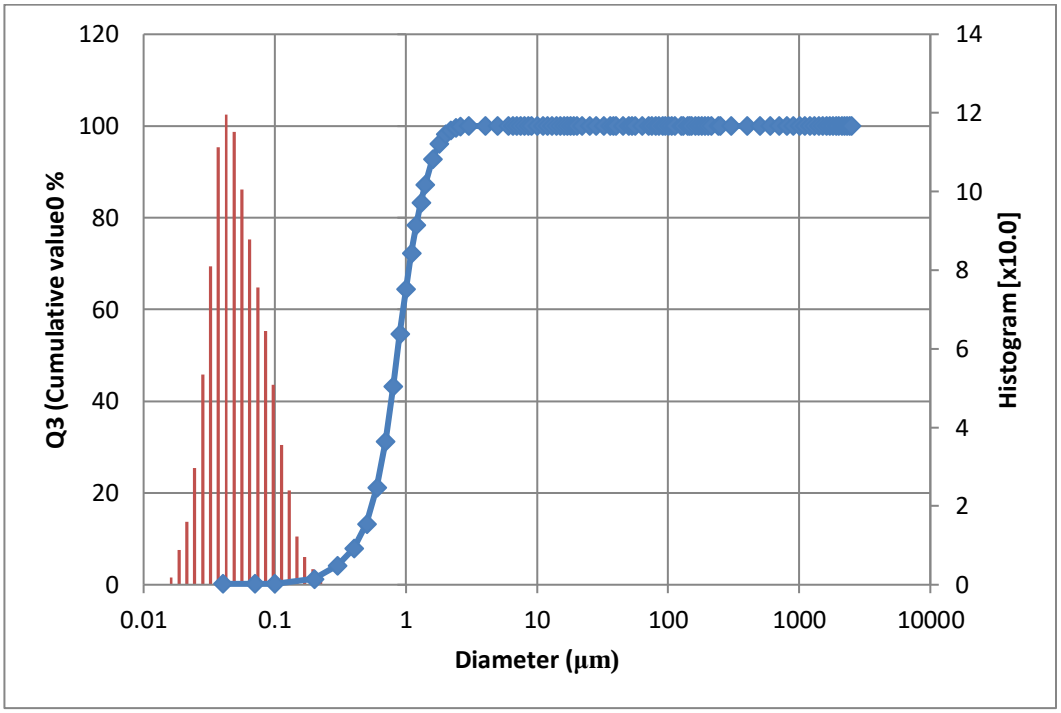


$D_{rata\text{-}rata}$: 6.19 mikron

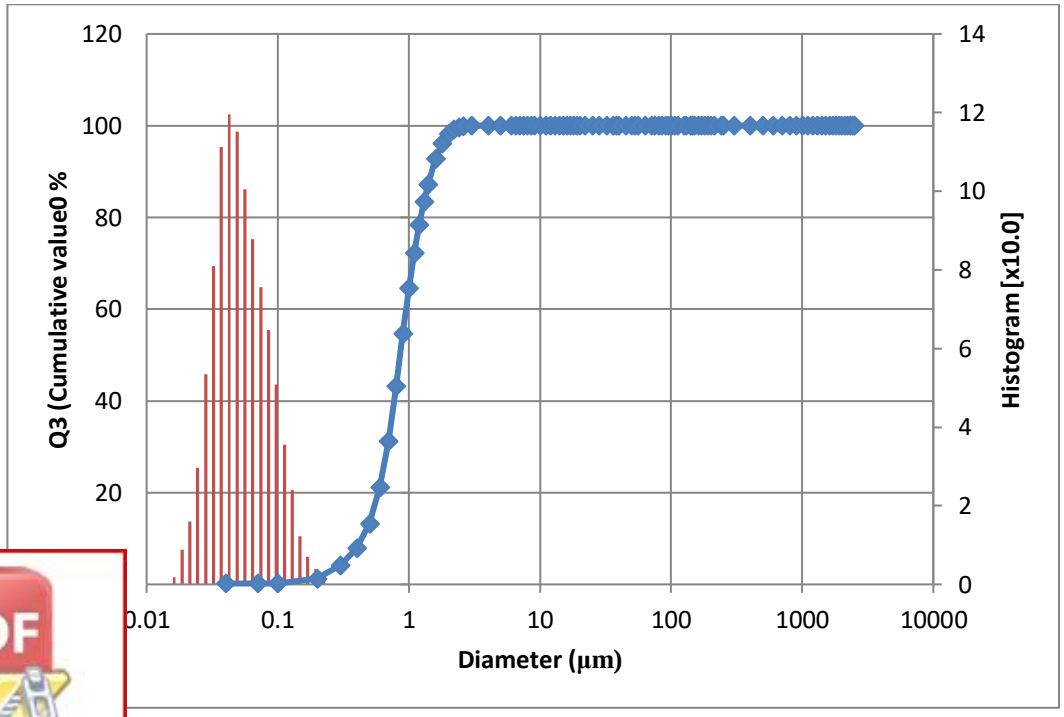


D.3 BiSCF-D nano 15:1

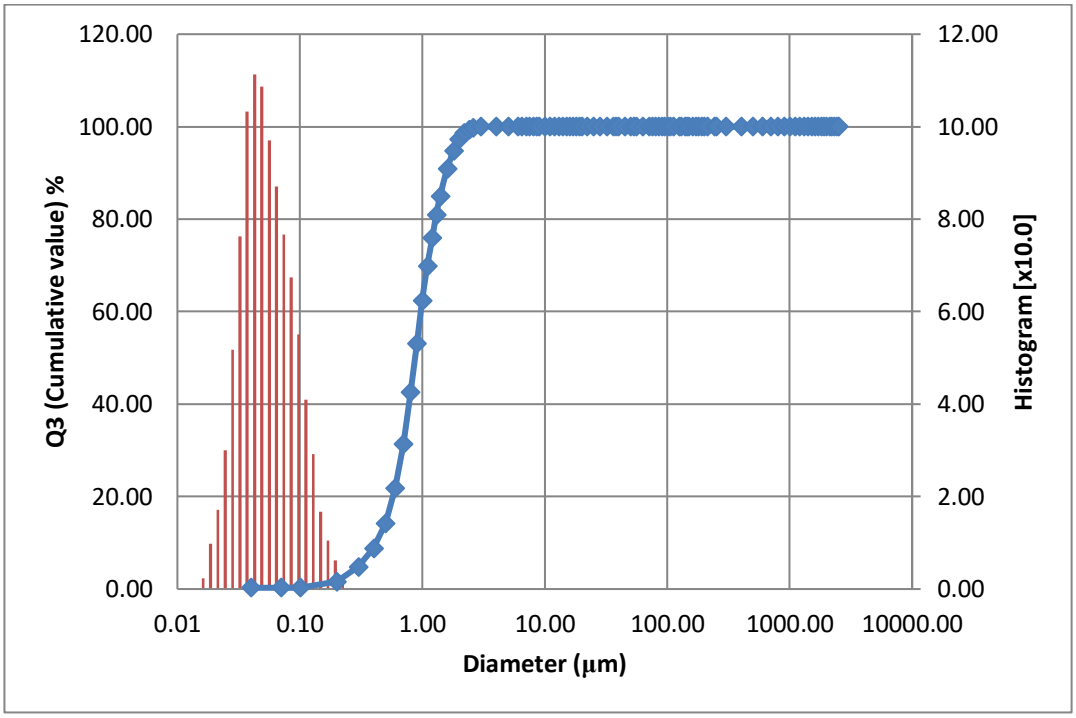
$D_{rata\text{-}rata}$: 0.92 mikron



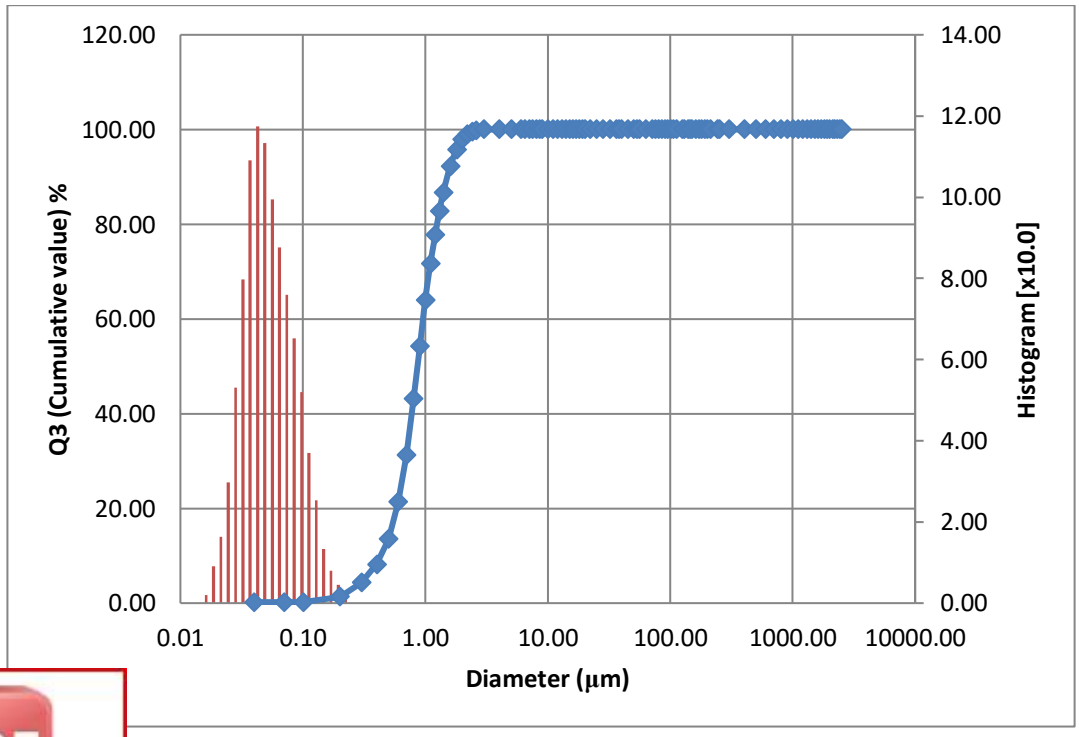
$D_{rata\text{-}rata}$: 0.92 mikron



$D_{rata\text{-}rata}$: 0.94 mikron

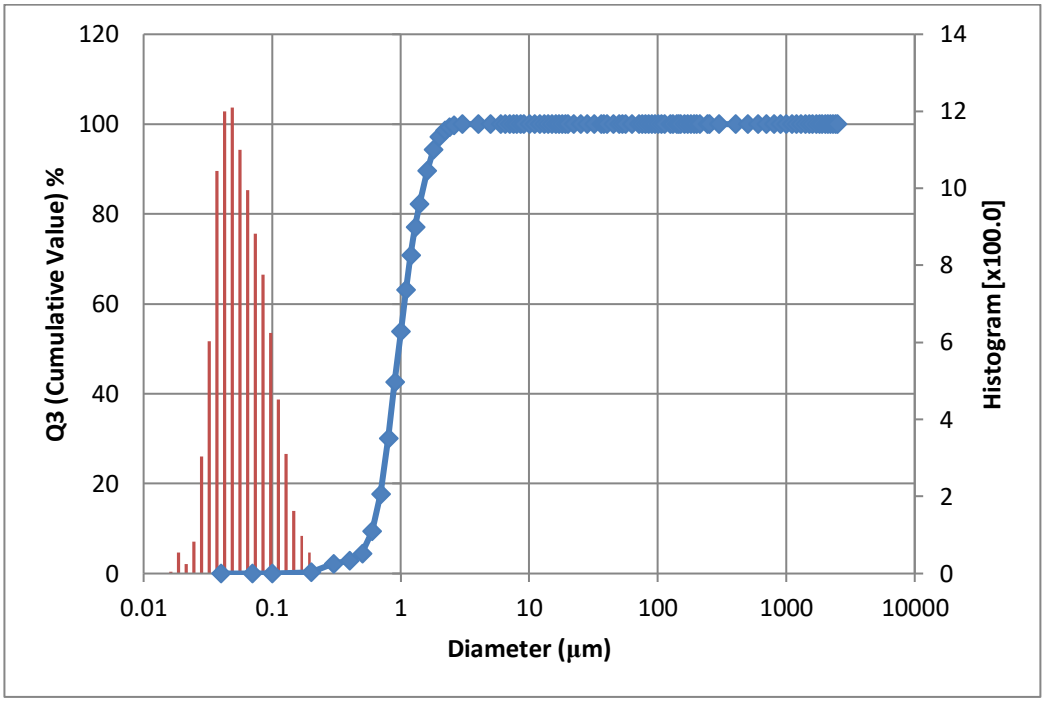


$D_{rata\text{-}rata}$:0.93 mikron

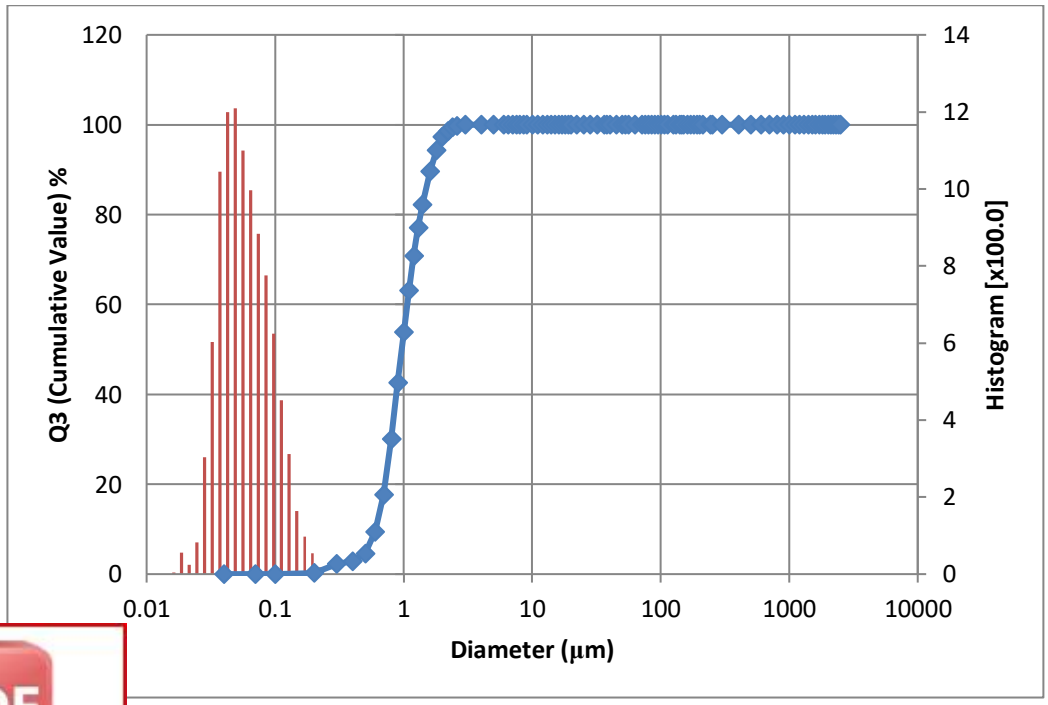


D.4 BiSCF-D nano 10:1

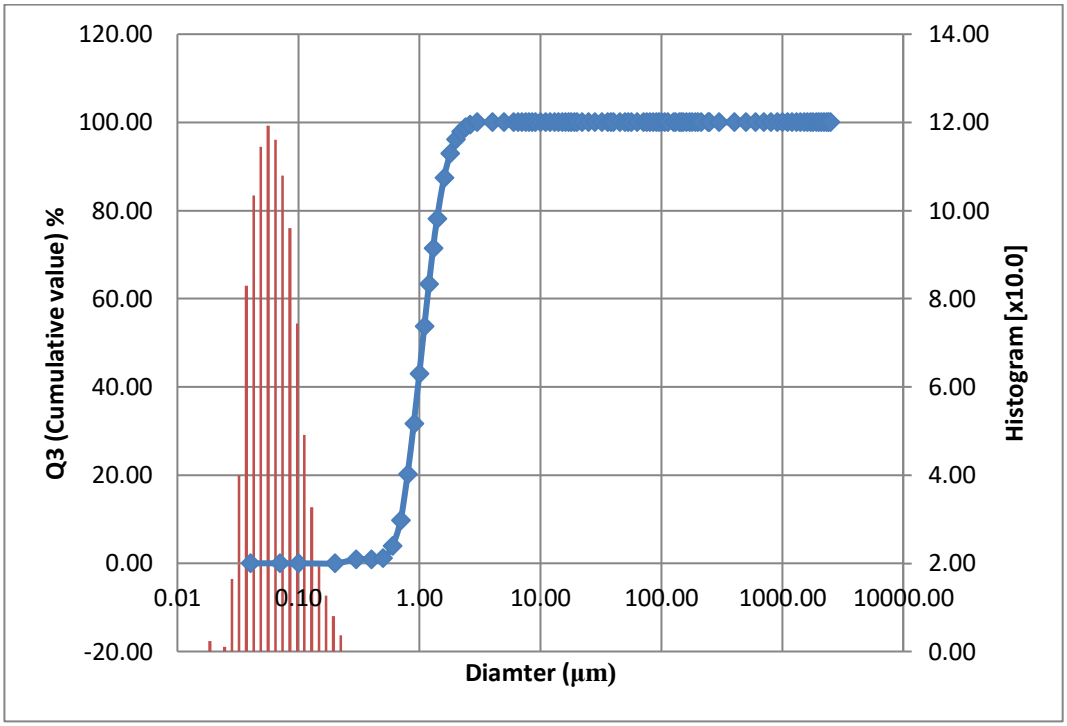
$D_{rata\text{-}rata}$ 1.04 mikron



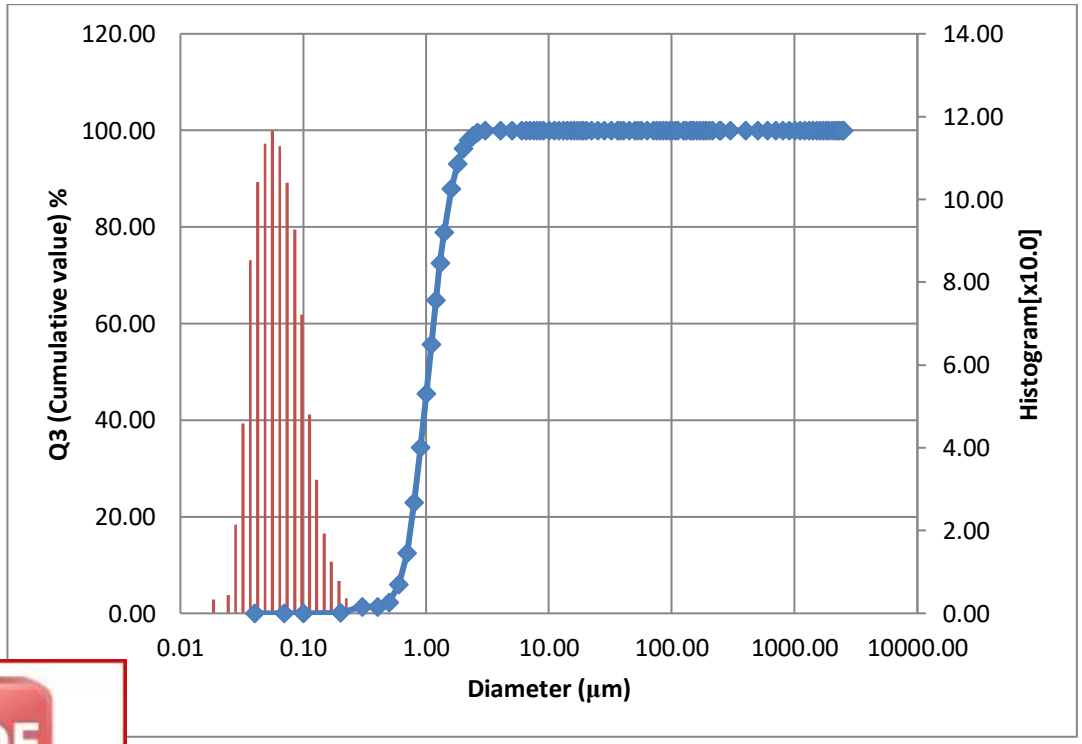
$D_{rata\text{-}rata}$ 1.04 mikron



$D_{rata\text{-}rata}$ 1.14 mikron



$D_{rata\text{-}rata}$ 1.12 mikron



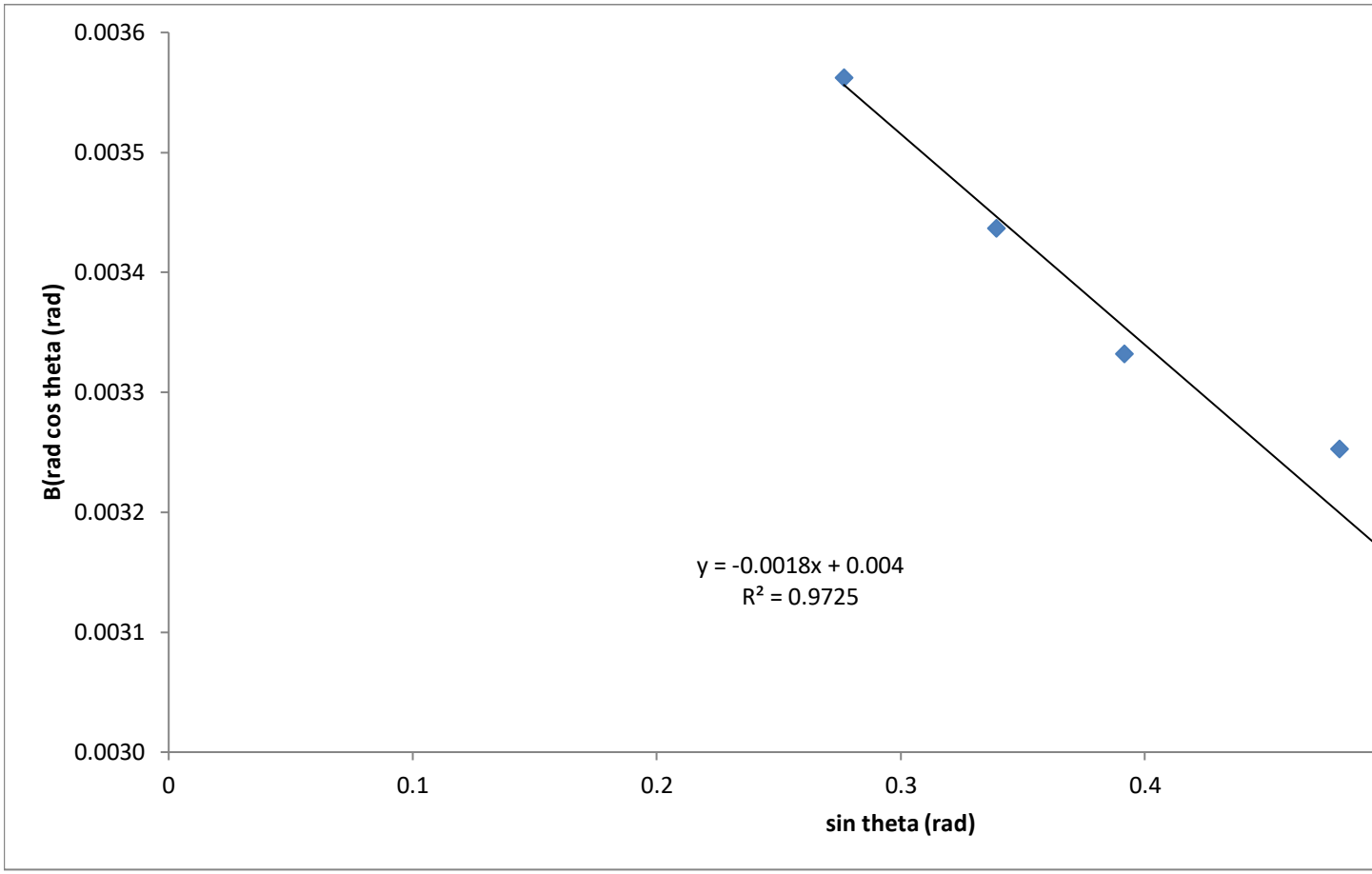
E. Porositas dan Densitas

Sampel	Massa Kering (gr)	Massa Jenuh (gr)	Massa Suspended (gr)	Porositas (%)	Mjenuh-M. Suspend	Densitas (gr/cm^3)
BiSCF-D (Nano 10:1)	3.883	4.095	0.978	6.801	3.117	1.246
BiSCF-D (Nano 15:1)	3.908	4.133	0.988	7.154	3.145	1.243
BiSCF- D (Nano 20:1)	3.916	4.165	0.964	7.779	3.201	1.223
BiSCF-D (Ori)	3.969	4.263	0.999	9.007	3.264	1.216

F. Konduktivitas Termal

G. TG-DTA

A. 15:1



BiSCF- Nano 15:1