LAMPIRAN A

PERHITUNGAN RAPAT ARUS SUPERKONDUKTOR

Dalam penelitian ini pelet superkonduktor mempunyai ukuran :

Lebar (a) : 1,96 mm $= 1,96 . 10^{-3}$ meter

Tinggi (b) : 1,02 mm $= 1,02 . 10^{-3}$ meter

Panjang (c) : 12,96 mm $= 1,296 . 10^{-2}$ meter

Luas permukaan pelet tegak lurus yang dilalui arus adalah

$$\text{Luas (A)} = a \times b$$
$$= (1,96 . 10^{-3}) \times (1,02 . 10^{-3}) \text{ meter}$$
$$= 1,99 . 10^{-6} \text{ meter}^2.$$

$$\text{Rapat arus kritis (} J_c \text{)} = \frac{I_c}{A}$$

$$= \frac{1,16 \text{ Ampere}}{1,99 . 10^{-6} \text{ meter}^2}$$

$$= 5,80 . 10^{5} \text{ A}/_{m^2}$$

Perhitungan ralat untuk rapat arus kritis superkonduktor :

$$Jc = \frac{Ic}{A} = \frac{Ic}{a \cdot b}$$

Diketahui :

$$a = 1,96 \cdot 10^{-3} \ m$$

$$\delta a = 1 \cdot 10^{-5} \ m$$

$$b = 1,02 \cdot 10^{-3} \ m$$

$$\delta b = 1 \cdot 10^{-5} \ m$$

$$Ic = 1,15 \ Ampere$$

$$\delta Ic = (0,01 \times 0,5) \ Ampere$$

$$= 5 \cdot 10^{-3} \ Ampere$$

$$\frac{\delta Jc}{\delta Ic} = \frac{1}{a \cdot b} = 5,02 \cdot 10^{5} \ /_{m^2}$$

$$\frac{\delta Jc}{\delta a} = -\frac{Ic}{a^2 \cdot b} = -0,293 \cdot 10^{9} \ Ampere/_{m^3}$$

$$\frac{\delta Jc}{\delta b} = -\frac{Ic}{a \cdot b^2} = -0,564 \cdot 10^{9} \ Ampere/_{m^3}$$

$$\overline{\delta Jc} = \sqrt{\left[\frac{\delta Jc}{\delta Ic}\right]^2 \delta Ic^2 + \left[\frac{\delta Jc}{\delta a}\right]^2 \delta a^2 + \left[\frac{\delta Jc}{\delta b}\right]^2 \delta b^2}$$

$$= \sqrt{(6,32 \cdot 10^{6}) + (0,404 \cdot 10^{8})}$$

$$= \sqrt{0,467 \cdot 10^8}$$

$$= 0,684 \cdot 10^4 \quad Ampere/_{m^2}$$

Jadi harga rapat arus kritis superkonduktor sebenarnya :

$$Jc = (5,80 \pm 0,068) \cdot 10^5 \quad Ampere/_{meter^2}$$

Ralat pengukuran rapat arus kritis dalam penelitian ini adalah sebesar

$$= \frac{\delta Jc}{Jc} \times 100\%$$

$$= \frac{0,068 \cdot 10^5}{5,80 \cdot 10^5} \times 100\%$$

$$= 1,178 \%$$

Keseksamaan $\quad = \quad 100\% - 1,178\%$

$$= 98,822\%$$

LAMPIRAN B

DATA HASIL PERHITUNGAN PARAMETER KRISTAL $YBa_2Cu_3O_{7-x}$

Hasil perhitungan parameter kristal sampel superkonduktor $YBa_2Cu_3O_{7-x}$ Hasil olah Ekstraksi.

No. Peak	2θ (degree)	d_{hkl} Å	I/I_o	hkl	Parameter kristal Å
9	32.783	2.7295	100	1 1 0	a = 3.8308
6	46.707	1.9431	60	0 2 0	b = 3.8862
3	58.247	1.5826	50	1 2 3	c = 11.6574

Hasil perhitungan parameter kristal sampel superkonduktor $YBa_2Cu_3O_{7-x}$ standart (Merck).

No. Peak	2θ (degree)	d_{hkl} Å	I/I_o	hkl	Parameter kristal Å
4	32.456	2.7562	100	1 1 0	a = 3.7990
6	46.566	1.9487	36	0 2 0	b = 3.8041
3	58.288	1.5816	31	1 2 3	c = 11.5872

LAMPIRAN C

DATA LITERATUR

Sumber :

J. Zhang, H. Cu, J. Xu, S. Gai dan D. Yin, *Microstruktur Study of High T_c Y-Ba-Cu-O*, Internasional Journal of Modern Physip B, Vol. 1 No.2 (1987) 351-353.

2θ	I/I_0	d (Å)	hkl
15,14	6	5,847	002
22,80	25	3,897	010
22,80	25	3,897	003
27,88	3	3,198	102
30,56	2	2,923	004
32,50	52	2,753	013
32,82	100	2,727	110
38,46	28	2,339	014
38,46	28	2,339	005
40,30	17	2,236	113
46,54	40	1,950	020
47,52	11	1,912	200
51,58	2	1,771	115
52,50	2	1,742	016
52,50	2	1,742	023
53,34	2	1,716	203
54,86	3	1,672	122
58,16	32	1,585	123
58,74	14	1,571	213
62,60	2	1,483	214
62,76	3	1,479	205
68,04	5	1,377	026
88,74	13	1,364	206

peak no.	2θ (deg)	d (A)	I/I₁	FWHM (deg)	intensity (kcps)	integrated int (kcps·deg)	type
1	68.758	1.3641	19	0.309	0.042	0.0186	A
2	58.681	1.5720	19	0.520L	0.042	0.0186 II	A
3	58.247	1.5826	50	0.327	0.107	0.0333	A
4	52.667	1.7364	9	0.524	0.020	0.0211	A
5	47.574	1.9097	14	0.169L	0.030	0.0106 II	A
6	46.707	1.9431	60	0.265	0.128	0.0471	A
7	40.368	2.2324	16	0.287	0.034	0.0144	A
8	38.580	2.3316	27	0.328	0.057	0.0251	A
9	32.783	2.7295	100	0.478	0.211	0.1047	A
10	23.897	3.7205	12	0.446	0.027	0.0153	A
11	22.868	3.8856	13	0.221	0.029	0.0070	∩
12	14.578	6.0710	9	2.666	0.021	0.0670	A

trongest 3 peaks

peak no.	2θ (deg)	d (A)	I/I₁	FWHM (deg)	intensity (kcps)	integrated int. (kcps·deg)
9	32.783	2.7295	100	0.478	0.211	0.1047
6	46.707	1.9431	60	0.265	0.128	0.0471
3	58.247	1.5826	50	0.327	0.107	0.0333

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< Y2O3 93 3   >

X-ray tube : target Cu   30 kV   30 mA
slit : (SS) 1 deg   (DS) 1 deg   (RS) .6 mm

scan mode : CONTI
preset time : 1 (s)
step width : .05418 (deg/step)
scan speed : 2 (deg/min)