

LAMPIRAN

Lampiran 1. Data Potensial Dekomposisi Tembaga

No	Voltase	Arus 1	Arus 2	Arus 3	Rata-rata
1	0.6	0	0	0	0
2	0.7	0	0	0	0
3	0.8	0	0	0	0
4	0.9	0	0	0	0
5	1	0	0	0.1	0.03
6	1.1	0.1	0	0.1	0.06
7	1.2	0.2	0.2	0.2	0.20
8	1.3	0.4	1.7	0.4	0.83
9	1.4	2.9	2.1	1.9	2.30
10	1.5	6.6	5.7	3.7	5.30
11	1.6	11.4	8.8	5.2	8.46
12	1.7	17.3	13.2	7.3	12.6
13	1.8	23.1	18.7	11.6	17.8
14	1.9	28.7	24.0	14.9	22.5
15	2	34.9	29.5	18.4	27.6
16	2.1	41.1	35.6	23.9	33.5
17	2.2	47.5	41.6	29.8	3.6
18	2.3	54.0	48.2	36.0	46.0
19	2.4	60.6	55.3	41.1	52.3
20	2.5	67.0	61.2	44.8	57.6

Lampiran 2. Data Potensial Dekomposisi Seng

No	Voltase	Arus 1	Arus 2	Arus 2	Rata-rata
1	1.6	0	0	0	0
2	1.7	0.1	0	0	0.03
3	1.8	0.1	0	0	0.03
4	1.9	0.1	0.1	0.1	0.10
5	2	0.3	0.1	0.2	0.20
6	2.1	0.6	0.4	0.2	0.40
7	2.2	1.1	1.2	0.3	0.86
8	2.3	2.0	2.2	0.3	1.50
9	2.4	2.8	3.8	1.7	2.76
10	2.5	5.1	5.3	4.8	5.06
11	2.6	9.6	9.4	8.3	9.10
12	2.7	13.0	16.0	12.5	13.8
13	2.8	18.1	23.0	16.8	19.3
14	2.9	23.8	30.2	21.8	25.3
15	3	28.4	37.9	26.2	30.8

16	3.1	33.3	46.6	31.6	37.2
17	3.2	38.9	53.6	36.8	43.1
18	3.3	44.9	61.6	41.5	49.3
19	3.4	50.1	70.5	46.9	55.8
20	3.5	55.9	77.6	51.2	61.6
21	3.6	62.0	86.8	56.1	68.3
22	3.7	68.2	93.5	60.5	74.0
23	3.8	74.1	102.4	66.4	80.9

Lampiran 3. Data dan Perhitungan Pengaruh waktu elektrolisis dalam larutan CuSO₄

No	Waktu (menit)	W _{praktek} (mg)	W _{teori} (mg)	Arus (mA)
1	10	1,1	1,1	5,7
2	30	3,5	3,5	5,9
3	50	5.0	5,5	5,6
4	70	7.1	7,8	5,7
5	90	9.6	9,6	5,4
6	120	10.8	11,3	4,8

Perhitungan berat teori dan praktek

1. Waktu 120 menit

$$W = \frac{BM. i. t}{n. 96500}$$

$$W = \frac{63,5 \times 0,0048 \times 7200}{2 \times 96500}$$

$$W = 0,0113 \text{ g}$$

$$W = 11,3 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 27,0546 - 27,0438$$

$$= 0,0108 \text{ g}$$

$$= 10,8 \text{ mg}$$

2. Waktu 90 menit

$$W = \frac{BM. i. t}{n. 96500}$$

$$W = \frac{63,5 \times 0,0054 \times 5400}{2 \times 96500}$$

$$W = 0,0096 \text{ g}$$

$$W = 9,6 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 27,0530 - 27,0434$$

$$= 0,0096 \text{ g}$$

$$= 9,6 \text{ mg}$$

3. Waktu 70 menit

$$W = \frac{\text{BM. i. t}}{\text{n. 96500}}$$

$$W = \frac{63,5 \times 0,0057 \times 4200}{2 \times 96500}$$

$$W = 0,0078 \text{ g}$$

$$W = 9,6 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 27,0505 - 27,0434$$

$$= 0,0071 \text{ g}$$

$$= 7,1 \text{ mg}$$

4. Waktu 50 menit

$$W = \frac{\text{BM. i. t}}{\text{n. 96500}}$$

$$W = \frac{63,5 \times 0,0056 \times 3000}{2 \times 96500}$$

$$W = 0,0055 \text{ g}$$

$$W = 5,5 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 27,0483 - 27,0433$$

$$= 0,0050 \text{ g}$$

$$= 5,0 \text{ mg}$$

5. Waktu 30 menit

$$W = \frac{\text{BM. i. t}}{\text{n. 96500}}$$

$$W = \frac{63,5 \times 0,0059 \times 1800}{2 \times 96500}$$

$$W = 0,0035 \text{ g}$$

$$W = 3,5 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 27,0467 - 27,0434$$

$$= 0,0035 \text{ g}$$

$$= 3,5 \text{ mg}$$

6. Waktu 10 menit

$$W = \frac{\text{BM. i. t}}{\text{n. 96500}}$$

$$W = \frac{63,5 \times 0,0057 \times 600}{2 \times 96500}$$

$$W = 0,0011 \text{ g}$$

$$W = 1,1 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 27,0442 - 27,0431$$

$$= 0,0011 \text{ g}$$

$$= 1,1 \text{ mg}$$

Lampiran 4. Data dan Perhitungan Pengaruh waktu elektrolisis dalam larutan ZnSO₄

No	Waktu (menit)	W _{praktek} (mg)	W _{teori} (mg)	Arus (mA)
1	10	1,2	1,2	5,5
2	30	3,7	3,7	6,0
3	50	5,6	5,6	5,5
4	70	7,4	7,4	5,2
5	90	9,9	10,0	5,5
6	120	11,5	11,7	4,8

Perhitungan berat teori dan praktek

1. Waktu 120 menit

$$W = \frac{BM. i. t}{n. 96500}$$

$$W = \frac{65,37 \times 0,0048 \times 7200}{2 \times 96500}$$

$$W = 0,0117 \text{ g}$$

$$W = 11,7 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 26,5514 - 26,5399$$

$$= 0,0115 \text{ g}$$

$$= 11,5 \text{ mg}$$

2. Waktu 90 menit

$$W = \frac{BM. i. t}{n. 96500}$$

$$W = \frac{65,37 \times 0,0055 \times 5400}{2 \times 96500}$$

$$W = 0,0100 \text{ g}$$

$$W = 10,0 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 26,5492 - 26,5393$$

$$= 0,0099 \text{ g}$$

$$= 9,9 \text{ mg}$$

3. Waktu 70 menit

$$W = \frac{BM. i. t}{n. 96500}$$

$$W = \frac{65,37 \times 0,0052 \times 4200}{2 \times 96500}$$

$$W = 0,0074 \text{ g}$$

$$W = 7,4 \text{ mg}$$

$$W = W_2 - W_1$$

$$= 26,5463 - 26,5389$$

$$= 0,0074 \text{ g}$$

$$= 7,4 \text{ mg}$$

4. Waktu 50 menit

$$W = \frac{BM. i. t}{n. 96500} \qquad W = W_2 - W_1$$

$$W = \frac{65,37 \times 0,0055 \times 3000}{2 \times 96500} \qquad = 26,5442 - 26,5386$$

$$W = 0,0056 \text{ g} \qquad = 0,0056 \text{ g}$$

$$W = 5,6 \text{ mg} \qquad = 5,6 \text{ mg}$$

5. Waktu 30 menit

$$W = \frac{BM. i. t}{n. 96500} \qquad W = W_2 - W_1$$

$$W = \frac{65,37 \times 0,0060 \times 1800}{2 \times 96500} \qquad = 26,5422 - 26,5385$$

$$W = 0,0037 \text{ g} \qquad = 0,0037 \text{ g}$$

$$W = 3,7 \text{ mg} \qquad = 3,7 \text{ mg}$$

6. Waktu 10 menit

$$W = \frac{BM. i. t}{n. 96500} \qquad W = W_2 - W_1$$

$$W = \frac{65,37 \times 0,0055 \times 600}{2 \times 96500} \qquad = 26,5397 - 26,5385$$

$$W = 0,0012 \text{ g} \qquad = 0,0012 \text{ g}$$

$$W = 1,2 \text{ mg} \qquad = 1,2 \text{ mg}$$

Lampiran 5. Data dan Perhitungan Penentuan Presisi

- Bentuk elektroda berlubang dalam larutan CuSO_4

No	y (Berat Praktek)	$(y - \bar{y})$	$(y - \bar{y})^2$
1	11,3	0,04	0,0016
2	11,3	0,04	0,0016
3	11,2	-0,06	0,0036
Σ	33,8		0.00226
Rata-rata	11,26		

$$SD = \sqrt{\frac{\Sigma (y - \bar{y})^2}{n - 1}}$$

$$\begin{aligned}
 &= \sqrt{\frac{0,00226}{3-1}} \\
 &= \sqrt{\frac{0,00226}{2}} \\
 &= 0,46 \\
 &= 0,034
 \end{aligned}$$

$$\begin{aligned}
 \%RSD &= \frac{SD}{\bar{y}} \times 100 \% \\
 &= \frac{0,034}{11,26} \times 100 \% \\
 &= 0,3 \%
 \end{aligned}$$

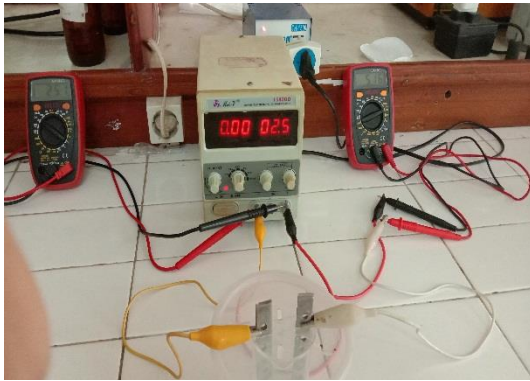
Lampiran 6. Data dan Perhitungan penentuan presisi metode

- Bentuk elektroda berluang dalam larutan ZnSO₄

No	y (Berat Praktek)	(y - \bar{y})	(y - \bar{y}) ²
1	11,5	0,02	0,04
2	11,6	0	0
3	11,7	0,1	0,01
Σ	34,8		0,05
Rata-rata	11,6		

$$\begin{aligned}
 SD &= \sqrt{\frac{\Sigma (y - \bar{y})^2}{n - 1}} \\
 &= \sqrt{\frac{0,05}{3-1}} \\
 &= \sqrt{\frac{0,05}{2}} \\
 &= 0,16 \\
 \%RSD &= \frac{SD}{\bar{y}} \times 100 \% \\
 &= \frac{0,16}{11,6} \times 100 \% \\
 &= 1,4 \% \text{ (teliti)}
 \end{aligned}$$

Lampiran 7. Dokumentasi Penelitian



Gambar 7. Rangkaian Elektrolisis



Gambar 8. Bentuk Elektroda



Gambar 9. Elektroda dicuci dengan Aseton



Gambar 10. Tembaga pada katoda



Gambar 11. Seng pada katoda



Gambar 12. Menimbang Endapan Logam