Lampiran 4 : Uji Parameter

Uji *Total Suspended Solid* (TSS)

Kertas Saring

Data Uji *Total Suspended Solid* (TSS)

No	Sampel	Berat Awal (g)	Berat Akhir (g)	Selisih Berat (g)	TSS (mg/L)	RPD (%)
1	Blangko 1	1.0892	1.0895	0.0003	10	0.00
2	Blangko 2	1.0887	1.0890	0.0003	10	
3	Dying 1	1.0887	1.1215	0.0328	1093	2.16
4	Dying 2	1.0895	1.1216	0.0321	1070	
5	Kromium 1	1.0888	1.2105	0.1217	4057	0.99
6	Kromium 2	1.0925	1.2130	0.1205	4017	
7	Mixing 1	1.0899	1.1812	0.0913	3043	-3.87
8	Mixing 2	1.0913	1.1862	0.0949	3163	
9	Effluent 1	1.0962	1.1135	0.0173	577	2.93
10	Effluent 2	1.0875	1.1043	0.0168	560	

Perhitungan *Total Suspended Solid* (TSS)

$$\text{TSS (mg/ L)} = \frac{(A-B) \times 1000}{V}$$

A = Berat kertas saring + residun (mg)

B = Berat kertas saring (mg)

V = Volume contoh uji (L)

Blanko A1

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}0895-1{,}0892) \times 1000}{0{,}030\ L} = 10 \text{ mg/ L}$$

Blanko A2

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}0890-1{,}0887) \times 1000}{0{,}030\ L} = 10 \text{ mg/ L}$$

Dying 1

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}1215-1{,}0887) \times 1000}{0{,}030\ L} = 1093 \text{ mg/ L}$$

Dying 2

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}1216-1{,}0895) \times 1000}{0{,}030\ L} = 1070 \text{ mg/ L}$$

Krom 1

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}2105-1{,}0888) \times 1000}{0{,}030\ L} = 4057 \text{ mg/ L}$$

Krom 2

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}2130-1{,}0925) \times 1000}{0{,}030\ L} = 4017 \text{ mg/ L}$$

Mixing 1

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}1812-1{,}0899) \times 1000}{0{,}030\ L} = 3043 \text{ mg/ L}$$

Mixing 2

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}1862-1{,}0913) \times 1000}{0{,}030\ L} = 3163 \text{ mg/ L}$$

Efluen 1

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}1135-1{,}0962) \times 1000}{0{,}030\ L}$$

Efluen 2

$$\text{TSS} = \frac{(A-B) \times 1000}{V} = \frac{(1{,}1043-1{,}0875) \times 1000}{0{,}030\ L}$$

= 577 mg/ L = 560 mg/ L

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Blanko

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$
$$= \left|\frac{10-10}{(10+10)/2}\right| \times 100\%$$
$$= 0\%$$

Dying

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$
$$= \left|\frac{1093-1070}{(1093+1070)/2}\right| \times 100\%$$
$$= 2{,}1572\ \%$$

Krom

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$
$$= \left|\frac{4057-4017}{(4057+4017)/2}\right| \times 100\%$$
$$= 0{,}9909\ \%$$

Mixing

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$
$$= \left|\frac{3043-3163}{(3043+3163)/2}\right| \times 100\%$$
$$= 3{,}8668\%$$

Efluen

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$
$$= \left|\frac{577-560}{(577+560)/2}\right| \times 100\%$$
$$= 2{,}9326\%$$

Uji Minyak dan Lemak

Data Uji Minyak dan Lemak

No	Contoh Uji	W_2	W_3	W_{23}	RPD
		gram	gram	mg/ L	(%)
1.	*Dying* 1	47,9197	47,9699	502	14,9
2.	*Dying* 2	62,2988	62,3420	432	
3.	Krom 1	63,3021	63,5534	2513	5,9
4.	Krom 2	62,7903	63,0570	2667	

No	Contoh Uji	W_2	W_3	W_{23}	RPD
		gram	gram	mg/ L	(%)
5.	*Mixing* 1	63,2948	63,4217	1269	0,3
6.	*Mixing* 2	62,4823	62,6088	1265	
7.	Efluen 1	62,2289	62,2422	133	2,3
8.	Efluen 2	62,6520	62,6650	130	

W_2 = Berat gelas piala kosong
W_3 = Berat gelas piala dan minyak lemak 1
W_{23} = Kadar Minyak Lemak

Perhitungan Minyak dan Lemak

$$\text{Kadar minyak lemak} = \frac{(W3-W2)\text{ x }1000000}{V}$$

Keterangan:

W_2 = berat gelas piala kosong, dinyatakan dalam (gram),

W_3 = berat gelas piala ditambah minyak lemak, dinyatakan dalam (gram)

V = volume contoh uji, dinyatakan dalam mililiter (mL)

Dying 1

$$W_{23} = \frac{(W3-W2)\text{x }1000000}{V}$$

$$= \frac{(47{,}9699-47{,}9197)\text{ x }1000000}{100}$$

= 502 mg/ L

Dying 2

$$W_{23} = \frac{(W3-W2)\text{x }1000000}{V}$$

$$= \frac{(62{,}3420-62{,}2988)\text{ x }1000000}{100}$$

= 432 mg/ L

Krom 1

$$W_{23} = \frac{(W3-W2)\text{x }1000000}{V}$$

$$= \frac{(63{,}5534-63{,}3021)\text{ x }1000000}{100}$$

= 2513 mg/ L

Krom 2

$$W_{23} = \frac{(W3-W2)\text{x }1000000}{V}$$

$$= \frac{(63{,}0570-62{,}7903)\text{ x }1000000}{100}$$

= 2667 mg/ L

Mixing 1

$$W_{23} = \frac{(W3-W2)x\ 1000000}{V}$$

$$= \frac{(63{,}4217-63{,}2948)\ x\ 1000000}{100}$$

= 1269 mg/ L

Mixing 2

$$W_{23} = \frac{(W3-W2)x\ 1000000}{V}$$

$$= \frac{(62{,}6088-62{,}4823)\ x\ 1000000}{100}$$

= 1265 mg/ L

Efluen 1

$$W_{23} = \frac{(W3-W2)x\ 1000000}{V}$$

$$= \frac{(62{,}2422-62{,}2289)\ x\ 1000000}{100}$$

= 133 mg/ L

Efluen 1

$$W_{23} = \frac{(W3-W2)x\ 1000000}{V}$$

$$= \frac{(62{,}6650-62{,}6520)\ x\ 1000000}{100}$$

= 130 mg/ L

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Dying

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{502-432}{(502+432)/2}\right| x\ 100\%$$

= 14,9 %

Krom

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{2513-2667}{(2513+2667)/2}\right| x\ 100\%$$

= 5,9 %

Mixing

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{1269-1265}{(1269+1265)/2}\right| x\ 100\%$$

= 0,3 %

Efluen

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{133-130}{(133+130)/2}\right| x\ 100\%$$

= 2,3 %

Uji Sulfida

Dokumentasi Pengujian Sulfida

Data Uji Sulfida

No	Sampel	V. Iodin (mL)	Normalitas Iodin (N)	V. Natrium Tiosulfat (mL)	Normalitas Natrium Tiosulfat (N)	V. Contoh Uji (mL)	Kadar Sulfida (mgS^{2-}/L)	RPD (%)
1	Dying 1	3	0.025	1.2	0.025	200	3.6	0.06
2	Dying 2	3	0.025	1.3	0.025	200	3.4	
3	Kromium 1	8	0.025	1.7	0.025	200	12.6	-0.02
4	Kromium 2	8	0.025	1.6	0.025	200	12.8	
5	Mixing 1	3	0.025	0.8	0.025	200	4.4	0.05
6	Mixing 2	3	0.025	0.9	0.025	200	4.2	
7	Effluent 1	3	0.025	1.5	0.025	200	3	0.07
8	Effluent 2	3	0.025	1.6	0.025	200	2.8	

Perhitungan Sulfida

$$\text{Kadar Sulfida} = ((\text{V iodin x N iodin}) - (\text{V Na2S2O3 x N Na2S2O3})) \text{ x } \frac{16000}{\text{V sampel}}$$

Dying 1 $= ((3 \text{ x } 0{,}025) - (1{,}2 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 3{,}6$ mg/L

Dying 2 $= ((3 \text{ x } 0{,}025) - (1{,}3 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 3{,}4$ mg/L

Krom 1 $= ((8 \text{ x } 0{,}025) - (1{,}7 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 12{,}6$ mg/L

Krom 2 $= ((8 \text{ x } 0{,}025) - (1{,}6 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 12{,}8$ mg/L

Mixing1 $= ((3 \text{ x } 0{,}025) - (0{,}8 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 4{,}4$ mg/L

Mixing2 $= ((3 \text{ x } 0{,}025) - (0{,}9 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 4{,}2$ mg/L

Efluen 1 $= ((3 \text{ x } 0{,}025) - (1{,}5 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 3$ mg/L

Efluen 2 $= ((3 \text{ x } 0{,}025) - (2{,}8 \text{ x } 0{,}025)) \text{ x } \frac{16000}{200}$

$= 2{,}8$ mg/L

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Dying

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{3,6-3,4}{(3,6+3,4)/2}\right| \times 100\%$$

= 5,71 %

Krom

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{12,6-12,8}{(12,6+12,8)/2}\right| \times 100\%$$

= 1,57 %

Mixing

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{4,4-4,2}{(4,4+4,2)/2}\right| \times 100\%$$

= 4,65 %

Efluen

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{3-2,8}{(3+2,8)/2}\right| \times 100\%$$

= 6,90 %

Uji Amonia

Standarisasi Amonia

No	Konsentrasi Standar KHP (mg/L) (X)	Absorbansi (A) (Y)	(XY)	(X^2)
1.	0	0	0	0
2.	0,1	0,066	0,0066	0,01
3.	0,2	0,093	0,0186	0,04
4.	0,3	0,148	0,0444	0,09
5.	0,5	0,217	0,1085	0,25
Total	1,1	0,524	0,1781	0,39

Perhitungan Persamaan Amonia

$$a = \frac{(\sum y)(\sum x^2)-(\sum x)(\sum xy)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{(0,524)(0,39)-(1,1)(0,1781)}{5(0,39)-(1,1)^2}$$

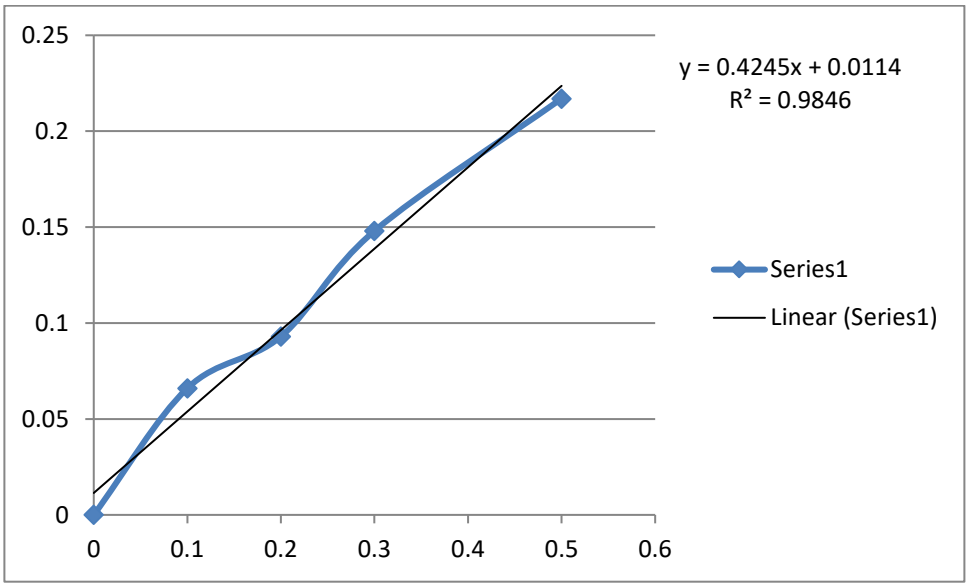
= 0,0114

$$b = \frac{n(\sum xy)-(\sum x)(\sum y)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{5(0,1781)-(1,1)(0,524)}{5(0,39)-(1,1)^2} = 0,4245$$

Y = bX + a

= 0,4245 X + 0,0114



Data Amonia

No	Sampel	Absorbansi	F Pengenceran	Kadar Amonia (mg/L)	RPD (%)
1.	*Dying* 1	0,069	200	27,14	0
2.	*Dying* 2	0,069	200	27,14	
3.	Krom 1	0,077	20	3,09	1,513
4.	Krom 2	0,078	20	3,14	
5.	*Mixing* 1	0,068	200	26,67	3,597
6.	*Mixing* 2	0,066	200	25,72	
7.	Efluen 1	0,085	20	3,47	1,349
8.	Efluen 2	0,086	20	3,51	

Y = aX + b

$$X = \frac{Y-b}{a}$$

Y = bX + a

= 0,4245x + 0,0114

Dying 1

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,069-0,0114}{0,4245}$$

= 0,14 mg/ L

Dying 2

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,069-0,0114}{0,4245}$$

= 0,14 mg/ L

Krom 1

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,077-0,0114}{0,4245}$$

= 0,15 mg/ L

Krom 2

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,078-0,0114}{0,4245}$$

= 0,16 mg/ L

Mixing 1

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,068-0,0114}{0,4245}$$

= 0,13 mg/ L

Mixing 2

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,066-0,0114}{0,4245}$$

= 0,13 mg/ L

Efluen 1

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,085-0,0114}{0,4245}$$

= 0,17 mg/ L

Efluen 2

$$X = \frac{Y-a}{b} = \frac{Y-0,0114}{0,4245} = \frac{0,086-0,0114}{0,4245}$$

= 0,18 mg/ L

Contoh Perhitungan Kadar Amonia dilakukan Pengenceran 200 kali dan 20 kali

Dying 1

Amonia = X x Pengenceran
= 0,14 mg/ L x 200
= 27,14 mg/L

Dying 2

Amonia = X x Pengenceran
= 0,14 mg/ L x 200
= 27,14 mg/L

Krom 1

Krom 2

Amonia = X x Pengenceran
= 0,15 mg/ L x 20
= 3,09 mg/L

Amonia = X x Pengenceran
= 0,16 mg/ L x 20
= 3,14 mg/L

Mixing 1
Amonia = X x Pengenceran
= 0,13 mg/ L x 200
= 26,67 mg/L

Mixing 2
Amonia = X x Pengenceran
= 0,13 mg/ L x 200
= 25,72 mg/L

Efluen 1
Amonia = X x Pengenceran
= 0,17 mg/ L x 20
= 3,47 mg/L

Efluen 2
Amonia = X x Pengenceran
= 0,18 mg/ L x 20
= 3,51 mg/L

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Dying

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{27{,}14-27{,}14}{(27{,}14+27{,}14)/2}\right| \text{ x } 100\%$$

= 0 %

Krom

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{3{,}09-3{,}14}{(3{,}09+3{,}14)/2}\right| \text{ x } 100\%$$

= 1,513 %

Mixing

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{26{,}67-25{,}72}{(26{,}67+25{,}72)/2}\right| \text{ x } 100\%$$

= 3,597 %

Efluen

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{3{,}47-3{,}51}{(3{,}47+3{,}51)/2}\right| \text{ x } 100\%$$

= 1,349 %

Uji *Biochemical Oxygen Demand* (BOD)

Data Volume Titrasi Blanko

No	Contoh Uji	N $_{Na2S2O7}$	F	Volume Titrasi 0 hari (m/L)	Volume Titrasi 5 hari (m/L)
1.	Blanko 1	0,0266	1,0081	1,7	1,7
2.	Blanko 2	0,0266	1,0081	1,6	1,6

Perhitungan Normalitas $Na_2S_2O_7$

$V_1 \times N_1 = V_2 \times N_2$

$V_{Na2S2O7} \times N_{Na2S2O7} = V_{K2Cr2O7} \times N_{K2Cr2O7}$

$9{,}4 \text{ mL} \times N_{Na2S2O7} = 10 \text{ mL} \times 0{,}025 \text{ N}$

$N_{Na2S2O7} = \frac{0{,}25 \text{ N mL}}{9{,}4 \text{ mL}}$

$N_{Na2S2O7} = 0{,}0266 \text{ N}$

Perhitungan Oksigen Terlarut 0 hari dan 5 hari

$$DO = \frac{V \times N \times F \times 8000}{50}$$

V = Volume titrasi $Na_2S_2O_7$ (mL)

N = Normalitas $Na_2S_2O_7$ (N)

F = faktor (volume botol dibagi volume botol dikurangi volume pereaksi MnSO4 dan alkali iodida azida)

Blanko 1

$DO_0 = \frac{1{,}7 \text{ mL} \times 0{,}0266 \text{ N} \times 1{,}0081 \times 8000}{50 \text{ mL}}$

$= 7{,}291 \text{ mg/ L}$

$DO_5 = \frac{1{,}7 \text{ mL} \times 0{,}0266 \text{ N} \times 1{,}0081 \times 8000}{50 \text{ mL}}$

$= 7{,}291 \text{ mg/ L}$

Blanko 2

$DO_0 = \frac{1{,}6 \text{ mL} \times 0{,}0266 \text{ N} \times 1{,}0081 \times 8000}{50 \text{ mL}}$

$= 6{,}865 \text{ mg/ L}$

$DO_5 = \frac{1{,}6 \text{ mL} \times 0{,}0266 \text{ N} \times 1{,}0081 \times 8000}{50 \text{ mL}}$

$= 6{,}865 \text{ mg/ L}$

Perhitungan Penurunan Oksigen Terlarut 0 hari dan 5 hari

Penurunan Blanko 1 $= \frac{(DO0 - DO5)}{P}$

$= \frac{(7,291 - 7,291)}{1}$

= 0 mg/L

Penurunan Blanko 2 $= \frac{(DO0 - DO5)}{P}$

$= \frac{(6,865 - 6,865)}{1}$

= 0 mg/L

Data Volume Titrasi Contoh Uji

No	Contoh Uji	N $_{Na2S2O7}$	F	Volume Titrasi 0 hari (m/L)	Volume Titrasi 5 hari (m/L)
1.	*Dying* 1	0,0266	1,0081	1,8	1,7
2.	*Dying* 2	0,0266	1,0081	1,8	1,7
3.	Krom 1	0,0266	1,0081	1,7	1,5
4.	Krom 2	0,0266	1,0081	1,7	1,5
5.	*Mixing* 1	0,0266	1,0081	1,6	1,4
6.	*Mixing* 2	0,0266	1,0081	1,7	1,5
7.	Efluen 1	0,0266	1,0081	1,6	1,5
8.	Efluen 2	0,0266	1,0081	1,6	1,5

Perhitungan Oksigen Terlarut 0 hari dan 5 hari

$$DO = \frac{V \times N \times F \times 8000}{50}$$

V = Volume titrasi $Na_2S_2O_7$ (mL)

N = Normalitas $Na_2S_2O_7$ (N)

F = faktor (volume botol dibagi volume botol dikurangi volume pereaksi MnSO4 dan alkali iodida azida)

Dying 1 *Dying* 2

$$DO_0 = \frac{1{,}8 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 7{,}723 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}7 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 7{,}294 \text{ mg/ L}$$

$$DO_0 = \frac{1{,}8 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 7{,}723 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}7 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 7{,}294 \text{ mg/ L}$$

Krom 1

$$DO_0 = \frac{1{,}7 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 7{,}294 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}5 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}436 \text{ mg/ L}$$

Krom 2

$$DO_0 = \frac{1{,}7 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 7{,}294 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}5 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}436 \text{ mg/ L}$$

Mixing 1

$$DO_0 = \frac{1{,}6 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}865 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}4 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}007 \text{ mg/ L}$$

Mixing 2

$$DO_0 = \frac{1{,}7 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 7{,}294 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}5 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}436 \text{ mg/ L}$$

Efluen 1

$$DO_0 = \frac{1{,}6 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}865 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}5 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}436 \text{ mg/ L}$$

Efluen 2

$$DO_0 = \frac{1{,}6 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}865 \text{ mg/ L}$$

$$DO_5 = \frac{1{,}5 \text{ mL x } 0{,}0266 \text{ N x } 1{,}0081 \text{ x } 8000}{50 \text{ mL}}$$
$$= 6{,}436 \text{ mg/ L}$$

Data BOD

No	Contoh Uji	DO_0 (mg/ L)	DO_5 (mg/ L)	BOD (mg/L)	RPD (%)
1.	*Dying* 1	7,723	7,294	429	0
2.	*Dying* 2	7,723	7,294	429	
3.	Krom 1	7,294	6,436	858	0
4.	Krom 2	7,294	6,436	858	
5.	*Mixing* 1	6,865	6,007	858	0
6.	*Mixing* 2	7,294	6,436	858	
7.	Efluen 1	6,865	6,436	429	0

No	Contoh Uji	DO_0 (mg/ L)	DO_5 (mg/ L)	BOD (mg/L)	RPD (%)
8.	Efluen 2	6,865	6,436	429	

Perhitungan BOD

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

A_1 = oksigen terlarut contoh uji sebelum inkubasi (0 hari) (mg/ L)
A_2 = oksigen terlarut contoh uji setelah inkubasi (5 hari) (mg/ L)
B_1 = oksigen terlarut blanko sebelum inkubasi (0 hari) (mg/ L)
B_2 = oksigen terlarut blanko uji setelah inkubasi (5 hari) (mg/ L)
Vb = volume suspensi mikroba dalam dalam botol DO blanko (mL)
Vc = volume suspensi mikroba dalam botol contoh uji (mL)
P = Perbandingan volume contoh uji (V_1) per volume total (V_2)

Dying 1

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(7{,}723-7{,}294)-\left(\frac{7{,}291-7{,}291}{0}\right) x\ 1}{\frac{1\ mL}{1000\ mL}}$$

= 429 mg/ L

Dying 2

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(7{,}723-7{,}294)-\left(\frac{6{,}865-6{,}865}{0}\right) x\ 1}{\frac{1\ mL}{1000\ mL}}$$

= 429 mg/ L

Krom 1

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(7{,}294-6{,}436)-\left(\frac{7{,}291-7{,}291}{0}\right) x\ 1}{\frac{1\ mL}{1000\ mL}}$$

= 858 mg/ L

Krom 2

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(7{,}294-6{,}436)-\left(\frac{6{,}865-6{,}865}{0}\right) x\ 1}{\frac{1\ mL}{1000\ mL}}$$

= 858 mg/ L

Mixing 1

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(6{,}865-6{,}007)-\left(\frac{7{,}291-7{,}291}{0}\right) x\ 1}{\frac{1\ mL}{1000\ mL}}$$

= 858 mg/ L

Mixing 2

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(7{,}294-6{,}436)-\left(\frac{6{,}865-6{,}865}{0}\right) x\ 1}{\frac{1\ mL}{1000\ mL}}$$

= 858 mg/ L

Efluen 1

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(6{,}865-6{,}865)-\left(\frac{7{,}291-7{,}291}{0}\right) x\ 1}{\frac{50\ mL}{1000\ mL}}$$

= 429 mg/ L

Efluen 2

$$BOD = \frac{(A1-A2)-\left(\frac{B1-B2}{Vb}\right) x\ Vc}{P}$$

$$= \frac{(6{,}436-6{,}436)-\left(\frac{6{,}865-6{,}865}{0}\right) x\ 1}{\frac{50\ mL}{1000\ mL}}$$

= 429 mg/ L

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Dying

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{429-429}{(429+429)/2}\right| x\ 100\%$$

= 0 %

Krom

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{858-858}{(858+858)/2}\right| x\ 100\%$$

= 0 %

Mixing

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{858-858}{(858+858)/2}\right| x\ 100\%$$

= 0 %

Efluen

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| x\ 100\%$$

$$= \left|\frac{429-429}{(0-0)/2}\right| x\ 100\%$$

= 0 %

Uji *Chemical Oxygen Demand* (COD)

Data Standar KHP COD

No	Konsentrasi Standar KHP (mg/L)	Absorbansi (A) (Y)	(XY)	(X^2)
1.	90	0,053	4,77	8100
2.	50	0,148	7,40	2500
3.	30	0,193	5,79	900
4.	10	0,241	2,41	100
5.	0	0,270	0	0
Total	180	0,905	20,37	11600

$$a = \frac{(\sum y)(\sum x^2)-(\sum x)(\sum xy)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{(0{,}905)(11600)-(180)(20{,}37)}{5(11600)-(180)^2}$$

$$= 0{,}26685$$

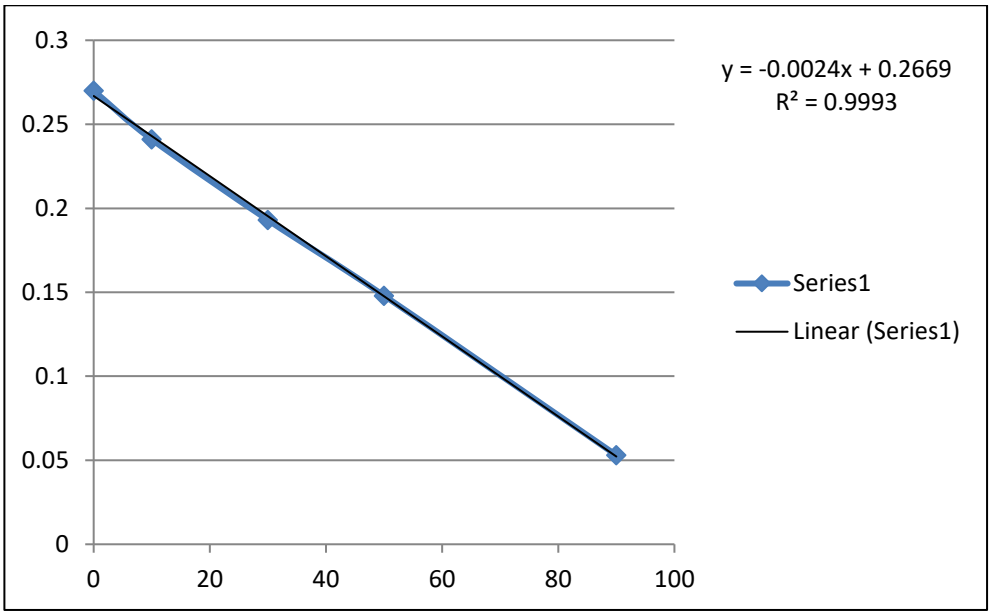
$$b = \frac{n(\sum xy)-(\sum x)(\sum y)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{6(38{,}91)-(250)(1{,}134)}{6(0{,}226)-(250)^2}$$

$$= -0{,}0023$$

$$Y = bX + a$$

$$= -0{,}002385x + 0{,}26685$$



Data COD

No	Contoh Uji	Pengenceran (kali)	Absorbansi (A)	COD (mg/L)	RPD (%)
1	*Dying* 1	20	0,059	1743	0
2	*Dying* 2	20	0,059	1743	
3	Krom 1	50	0,140	2659	0
4	Krom 2	50	0,140	2659	
5	*Mixing* 1	20	0,095	1441	0,138
6	*Mixing* 2	20	0,094	1449	
7	Efluen 1	20	0,162	879	0
8	Efluen 2	20	0,162	879	

Y = aX + b

$$X = \frac{Y-b}{a}$$

Y = bX + a

= -0,002385x + 0,26685

Dying 1

$$X = \frac{Y-a}{b}$$

$$= \frac{Y-0,26685}{-0,002385}$$

$$= \frac{0,059-0,26685}{-0,002385}$$

= 87,15 mg/ L

Dying 2

$$X = \frac{Y-a}{b}$$

$$= \frac{Y-0,26685}{-0,002385}$$

$$= \frac{0,059-0,26685}{-0,002385}$$

= 87,15 mg/ L

Krom 1

$$X = \frac{Y-a}{b}$$

$$= \frac{Y-0,26685}{-0,002385}$$

$$= \frac{0,140-0,26685}{-0,002385}$$

= 53,19 mg/ L

Krom 2

$$X = \frac{Y-a}{b}$$

$$= \frac{Y-0,26685}{-0,002385}$$

$$= \frac{0,140-0,26685}{-0,002385}$$

= 53,19 mg/ L

Mixing 1

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0,26685}{-0,002385}$$
$$= \frac{0,095-0,26685}{-0,002385}$$
$$= 72,05 \text{ mg/ L}$$

Mixing 2

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0,26685}{-0,002385}$$
$$= \frac{0,094-0,26685}{-0,002385}$$
$$= 72,47 \text{ mg/ L}$$

Efluen 1

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0,26685}{-0,002385}$$
$$= \frac{0,162-0,26685}{-0,002385}$$
$$= 43,96 \text{ mg/ L}$$

Efluen 2

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0,26685}{-0,002385}$$
$$= \frac{0,162-0,26685}{-0,002385}$$
$$= 43,96 \text{ mg/ L}$$

Perhitungan COD dengan Pengenceran 20 kali

COD = X x Pengenceran

Dying 1

COD = X x Pengenceran
= 87,15 mg/ L x 20
= 1743 mg/L

Dying 2

COD = X x Pengenceran
= 87,15 mg/ L x 20
= 1743 mg/L

Krom 1

COD = X x Pengenceran
= 53,19 mg/ L x 50
= 2659,5 mg/L

Krom 2

COD = X x Pengenceran
= 53,19 mg/ L x 50
= 2659,5 mg/L

Mixing 1

COD = X x Pengenceran
= 72,05 mg/ L x 20
= 1441 mg/L

Mixing 2

COD = X x Pengenceran
= 72,47 mg/ L x 20
= 1449,4 mg/L

Efluen 1

COD = X x Pengenceran
= 43,96 mg/ L x 20
= 879,2 mg/L

Efluen 2

COD = X x Pengenceran
= 43,96 mg/ L x 20
= 879,2 mg/L

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Dying

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{1743-1743}{(1743+1743)/2}\right| \times 100\%$$

= 0 %

Krom

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{1743-1743}{(1743+1743)/2}\right| \times 100\%$$

= 0 %

Mixing

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{1441-1449}{(1441+1449)/2}\right| \times 100\%$$

= 0,138 %

Efluen

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{879-879}{(879+879)/2}\right| \times 100\%$$

= 0 %

Uji Nitrogen Total

Data Standar N Total

No	Konsentrasi Standar KHP (mg/L) (X)	Absorbansi (A) (Y)	(XY)	(X^2)
1.	0	0,002	0	0
2.	0,5	0,003	0,0015	0,25
3.	1,0	0,005	0,0050	1,00
4.	2,5	0,009	0,0225	6,25
5.	5,0	0,016	0,0800	25,00
Total	9,0	0,035	0,1090	32,50

$$a = \frac{(\sum y)(\sum x^2)-(\sum x)(\sum xy)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{(0{,}035)(32{,}50)-(9{,}0)(0{,}1090)}{5(32{,}50)-(9{,}0)^2}$$

= 0,00192

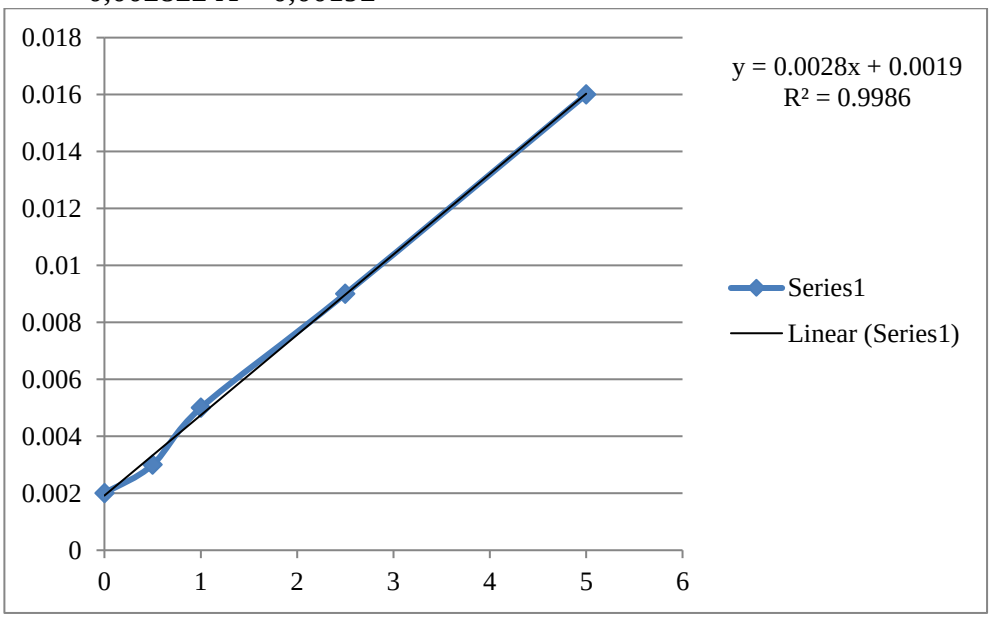
$$b = \frac{n(\sum xy)-(\sum x)(\sum y)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{5(0,1090)-(9,0)(0,035)}{5(32,50)-(9,0)^2}$$

= 0,002822

Y = bX + a

= 0,002822 X + 0,00192



Data Nitrogen Total

No	Contoh Uji	Absorbansi	X (mg/L)	Pengenceran	Kadar Nitrogen	N Total
1.	*Dying* A1	0,009	2,51	10	25	456
2.	*Dying* O1	0,008	2,15	200	431	
3.	*Dying* A2	0,010	2,86	10	29	460
4.	*Dying* O2	0,008	2,15	200	431	
5.	Krom A1	0,003	0,38	100	38	147
6.	Krom O1	0,005	1,09	100	109	
7.	Krom A2	0,003	0,38	100	38	147
8.	Krom O2	0,005	1,09	100	109	
9.	*Mixing* A1	0,008	2,15	100	215	788
10.	*Mixing* O1	0,010	2,86	200	573	
11.	*Mixing* A2	0,008	2,15	100	215	788
12.	*Mixing* O2	0,010	2,86	200	573	

No	Contoh Uji	Absorbansi	X (mg/L)	Pengenceran	Kadar Nitrogen	N Total
13.	Efluen A1	0,012	3,57	10	36	54
14.	Efluen O1	0,007	1,80	10	18	
15.	Efluen A2	0,013	3,93	10	39	57
16.	Efluen O2	0,007	1,80	10	18	

Perhitungan Nitrogen Total

Dying A1

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0{,}00192}{0{,}002822}$$
$$= \frac{0{,}009-0{,}00192}{0{,}002822}$$
$$= 2{,}51 \text{ mg/ L}$$

Dying O1

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0{,}00192}{0{,}002822}$$
$$= \frac{0{,}008-0{,}00192}{0{,}002822}$$
$$= 2{,}15 \text{ mg/ L}$$

Dying A2

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0{,}00192}{0{,}002822}$$
$$= \frac{0{,}010-0{,}00192}{0{,}002822}$$
$$= 2{,}86 \text{ mg/ L}$$

Dying O2

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0{,}00192}{0{,}002822}$$
$$= \frac{0{,}008-0{,}00192}{0{,}002822}$$
$$= 2{,}15 \text{ mg/ L}$$

Krom A1

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0{,}00192}{0{,}002822}$$
$$= \frac{0{,}003-0{,}00192}{0{,}002822}$$
$$= 0{,}38 \text{ mg/ L}$$

Krom O1

$$X = \frac{Y-a}{b}$$
$$= \frac{Y-0{,}00192}{0{,}002822}$$
$$= \frac{0{,}005-0{,}00192}{0{,}002822}$$
$$= 1{,}09 \text{ mg/ L}$$

Krom A2

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}003-0{,}00192}{0{,}002822} = 0{,}38 \text{ mg/ L}$$

Krom O2

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}005-0{,}00192}{0{,}002822} = 1{,}09 \text{ mg/ L}$$

Mixing A1

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}008-0{,}00192}{0{,}002822} = 2{,}15 \text{ mg/ L}$$

Mixing O1

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}010-0{,}00192}{0{,}002822} = 2{,}86 \text{ mg/ L}$$

Mixing A2

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}008-0{,}00192}{0{,}002822} = 2{,}15 \text{ mg/ L}$$

Mixing O2

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}010-0{,}00192}{0{,}002822} = 2{,}86 \text{ mg/ L}$$

Efluen A1

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}012-0{,}00192}{0{,}002822} = 3{,}57 \text{ mg/ L}$$

Efluen O1

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}007-0{,}00192}{0{,}002822} = 1{,}80 \text{ mg/ L}$$

Efluen A2

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}013-0{,}00192}{0{,}002822} = 3{,}93 \text{ mg/ L}$$

Efluen O2

$$X = \frac{Y-a}{b} = \frac{Y-0{,}00192}{0{,}002822} = \frac{0{,}007-0{,}00192}{0{,}002822} = 1{,}80 \text{ mg/ L}$$

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Dying

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{456-460}{(456+460)/2}\right| \times 100\%$$

$$= 1\ \%$$

Krom

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{147-147}{(147+147)/2}\right| \times 100\%$$

$$= 0\ \%$$

Mixing

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{788-788}{(788+788)/2}\right| \times 100\%$$

$$= 0\ \%$$

Efluen

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \times 100\%$$

$$= \left|\frac{54-57}{(54+57)/2}\right| \times 100\%$$

$$= 6\ \%$$

Uji Kromium

Data Standarisasi Kromium

No	Standar	Konsentrasi (mg/L) (X)	Absorbansi (A) (Y)	XY	X^2
1.	Blanko	--	0	0	0
2.	STD 1	0,2	0,0086	0,0017	0,04
3.	STD 2	0,5	0,0285	0,0143	0,25
4.	STD 3	1,0	0,0569	0,0569	1
5.	STD 4	2,0	0,1093	0,2186	4
6.	STD 5	3,0	0,1601	0,4803	9
7.	STD 6	4,0	0,1976	0,7904	16
8.	STD 7	5,0	0,2482	1,2410	25
Total		15,7	0,8092	2,80317	55,29

$$a = \frac{(\sum y)(\sum x^2)-(\sum x)(\sum xy)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{(0{,}8092)(55{,}29)-(15{,}7)(2{,}80317)}{6(55{,}29)-(15{,}7)^2}$$

= 0,0052

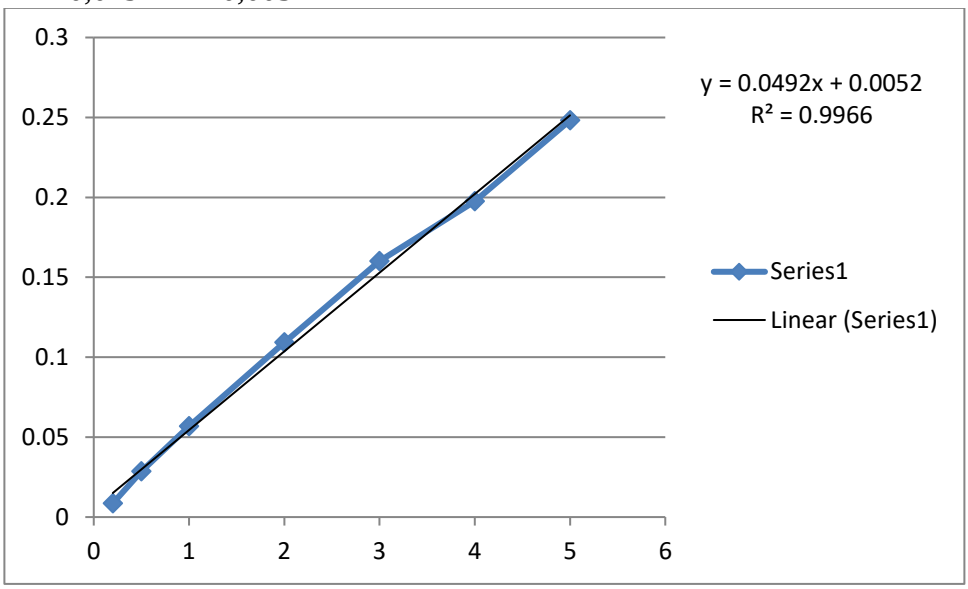
$$b = \frac{n(\sum xy)-(\sum x)(\sum y)}{n(\sum x^2)-(\sum x)^2}$$

$$= \frac{6\,(2{,}80317)-(15{,}7)(0{,}8092)}{6(55{,}29)-(15{,}7)^2}$$

= 0,0492

Y = bX + a

= 0,0492 X + 0,0052



Data Kromium

No	Contoh Uji	Absorbansi (A)	X (mg/L)	Pengen ceran	Krom (mg/L)	RPD (%)
1.	*Dying* 1	0,1041	2,01016	100	201,0	1,206
2.	*Dying* 2	0,1053	2,03455	100	203,5	
3.	Krom 1	0,0663	1,24187	10000	12418,7	0,574
4.	Krom 2	0,1267	2,46951	5000	12347,6	
5.	*Mixing* 1	0,2620	5,21951	100	522,0	2,046
6.	*Mixing* 2	0,2568	5,11382	100	511,4	
7.	Efluen 1	0,0284	0,47154	100	47,2	1,302
8.	Efluen 2	0,0281	0,46545	100	46,5	

Perhitungan Nilai X

$X = \frac{Y-a}{b}$

$Y = bX + a$

$= 0{,}0492\ X + 0{,}0052$

Dying 1

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}1041-0{,}0052}{0{,}0492}$

= 2,01016 mg/ L

Dying 2

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}1053-0{,}0052}{0{,}0492}$

= 2,03455 mg/ L

Krom 1

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}0663-0{,}0052}{0{,}0492}$

= 1,24187 mg/ L

Krom 2

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}1267-0{,}0052}{0{,}0492}$

= 2,46951 mg/ L

Mixing 1

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}2620-0{,}0052}{0{,}0492}$

= 5,21951 mg/ L

Mixing 2

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}2568-0{,}0052}{0{,}0492}$

= 5,11382 mg/ L

Efluen 1

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}0284-0{,}0052}{0{,}0492}$

= 0,47154 mg/ L

Efluen 2

$X = \frac{Y-a}{b}$

$= \frac{Y-0{,}0052}{0{,}0492}$

$= \frac{0{,}0281-0{,}0052}{0{,}0492}$

= 0,46545 mg/ L

Perhitungan Kromium dengan Perlakuan Pengenceran

Kromium = X x Pengenceran

Dying 1

Krom = X x Pengenceran
= 2,01016 mg/ L x 100
= 201,0 mg/L

Dying 2

Krom = X x Pengenceran
= 2,03455 mg/ L x 100
= 203,5 mg/L

Krom 1

Krom = X x Pengenceran
= 1,24187 mg/ L x 10000
= 12418,7 mg/L

Krom 2

Krom = X x Pengenceran
= 2,46951 mg/ L x 5000
= 12347,6 mg/L

Mixing 1

Krom = X x Pengenceran
= 5,21951 mg/ L x 100
= 522,0 mg/L

Mixing 2

Krom = X x Pengenceran
= 5,11382 mg/ L x 100
= 511,4 mg/L

Efluen 1

Krom = X x Pengenceran
= 0,47154 mg/ L x 100
= 47,2 mg/L

Efluen 2

Krom = X x Pengenceran
= 0,46545 mg/ L x 100
= 46,5 mg/L

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

x1 = hasil pengukuran
x2 = duplikat pengukuran

Dying

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{201{,}0-203{,}5}{(201{,}0+203{,}5)/2}\right| \text{ x } 100\%$$

= 1,206 %

Krom

$$\text{RPD} = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{12418{,}7-12347{,}6}{(12418{,}7+12347{,}6)/2}\right| \text{ x } 100\%$$

= 0,574 %

Mixing

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{522{,}0-511{,}4}{(522{,}0+511{,}4)/2}\right| \text{ x } 100\%$$

$$= 2{,}046\ \%$$

Efluen

$$RPD = \left|\frac{x1-x2}{(x1+x2)/2}\right| \text{ x } 100\%$$

$$= \left|\frac{47{,}2-46{,}5}{(47{,}2-46{,}5)/2}\right| \text{ x } 100\%$$

$$= 1{,}302\ \%$$