



Kementerian
Perindustrian
REPUBLIK INDONESIA



Seminar PKT - 35





ANALISIS produk pupuk organik cair merek “X”





PKT 35



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Metode Analisis

Hasil Analisis dan Pembahasan

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Kesimpulan dan Saran



PENDAHULUAN

Pendahuluan



Kegunaan pupuk bagi tanaman



Pendahuluan



Jenis-jenis Pupuk



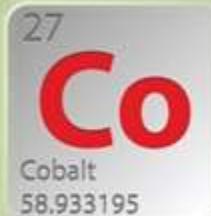
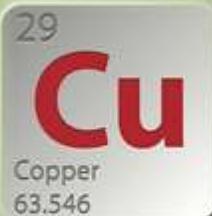
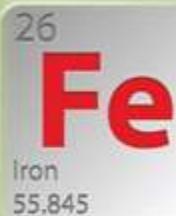
Pendahuluan



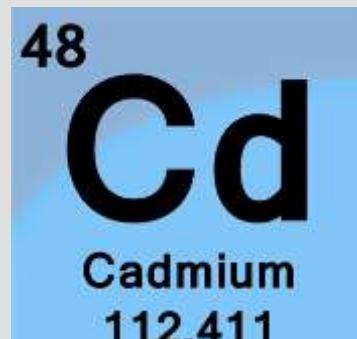
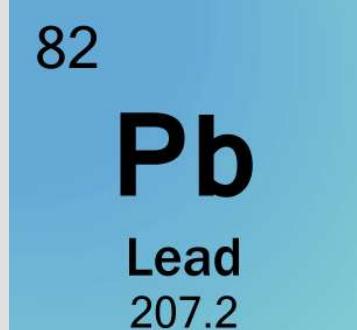
Unsur Hara Makro



Unsur Hara Mikro



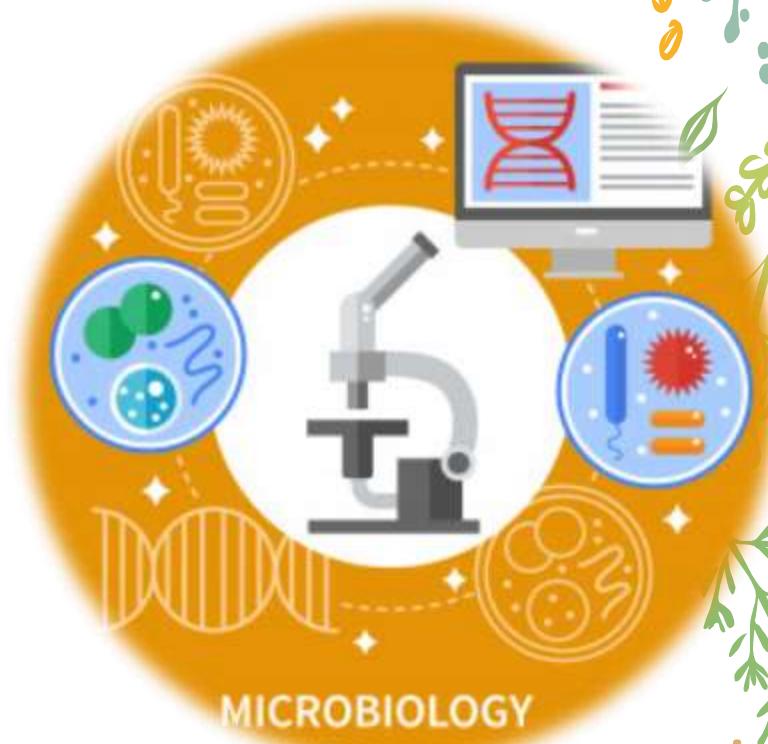
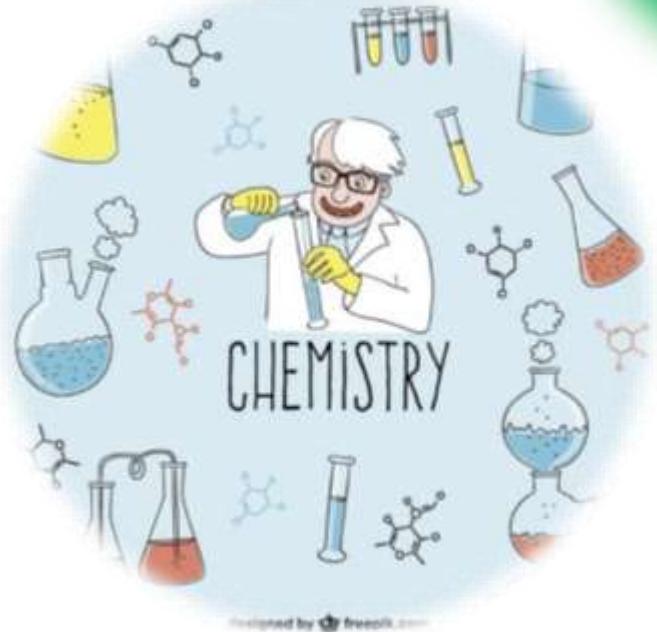
Cemaran Logam Berat



METODE ANALISIS



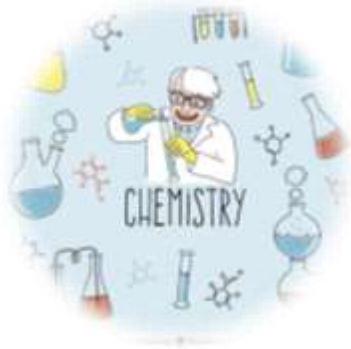
Metode Analisis



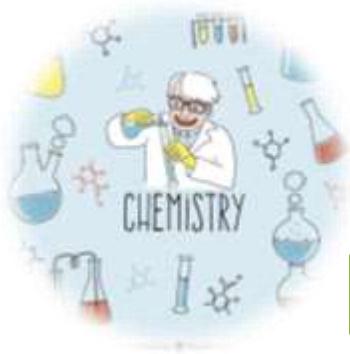
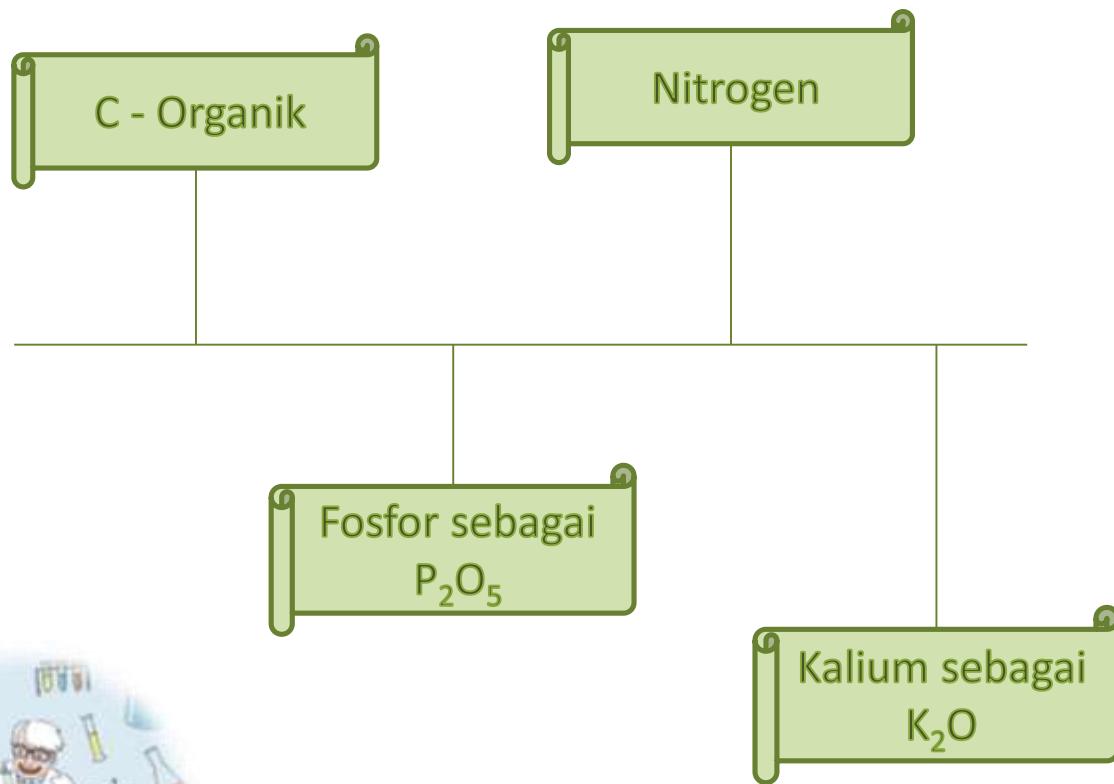
Metode Analisis



Uji pH



Metode Analisis



C-Organik dan Unsur Hara Makro



Metode Analisis



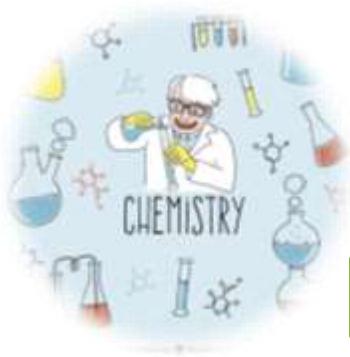
Besi Total (Fe)

Kobalt (Co)

Seng (Zn)

Tembaga (Cu)

Mangan (Mn)



Unsur Hara Mikro

Metode Analisis



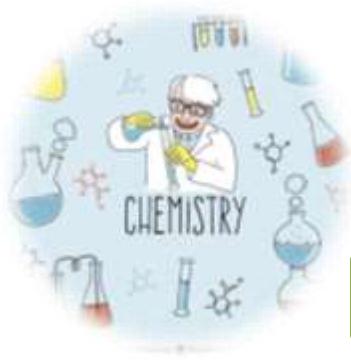
Raksa (Hg)

Arsen (As)

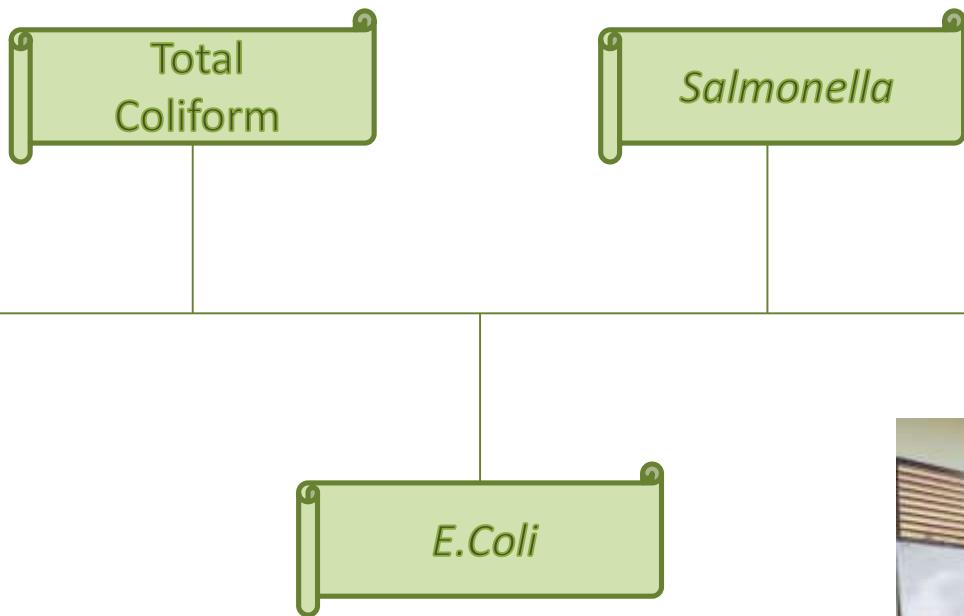
Timbal (Pb)

Kadmium (Cd)

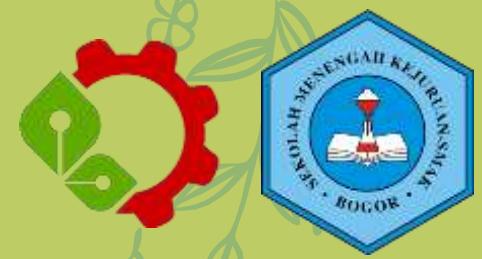
Cemaran Logam



Metode Analisis



HASIL ANALISIS DAN PEMBAHASAN



Hasil Analisis dan Pembahasan

Standar yang digunakan :

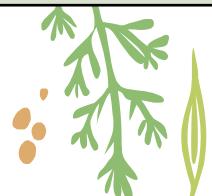
Peraturan Menteri Pertanian
No.70/Permentan/SR.140/10/2011



Hasil Analisis dan Pembahasan



No	Parameter Uji	Satuan	Standar Mutu	Hasil
1	C – Organik	%	Min. 6	0.16%
2	pH	-	4 - 9	6.65
3	Logam Berat			
3.1	Arsen (As)	Ppm	Maks 2.5	<2.2594 ppb
3.2	Kadmium (Cd)	Ppm	Maks 0.5	<0.0025 ppm
3.3	Raksa (Hg)	Ppm	Maks 0.25	<2.7259 ppb
3.4	Timbal (Pb)	ppm	Maks 12.5	0.5478 ppm



Hasil Analisis dan Pembahasan



No	Parameter Uji	Satuan	Standar Mutu	Hasil
4	Hara Makro			
4.1	Nitrogen (N)	%	3 – 6	0.022%
4.2	P ₂ O ₅	%	3 – 6	23.53 ppm
4.3	K ₂ O	%	3 – 6	2.83 ppm
5	Cemaran Mikroba			
5.1	<i>E.Coli</i>	MPN/ml	Maks. 10 ²	9 MPN/ml
5.2	<i>Salmonella sp</i>	MPN/ml	Maks 10 ²	<3 MPN/ml



Hasil Analisis dan Pembahasan



No	Parameter Uji	Satuan	Standar Mutu	Hasil
6	Hara Mikro			
6.1	Besi (Fe) Total	Ppm	90 – 900	3.6980 ppm
6.2	Kobalt (Co)	Ppm	5 – 20	<0.2860 ppm
6.3	Mangan (Mn)	Ppm	250 – 5000	<0.8929 ppm
6.4	Tembaga (Cu)	Ppm	250 – 5000	0.0078 ppm
6.5	Seng (Zn)	Ppm	250 – 5000	2.79 ppm



ANALISIS KEWIRAUUSAHAAN



Analisis Kewirausahaan



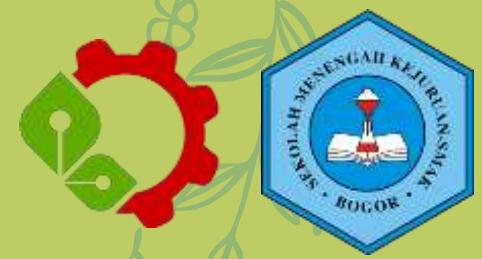
No.	Parameter Uji	Harga Bahan	Laba	Biaya Analisis
1	Uji pH	Rp8.000	Rp2.400	Rp10.400
2	Kadar C – Organik	Rp65.000	Rp19.500	Rp84.500
3	Kadar Nitrogen	Rp72.000	Rp21.600	Rp93.600
4	Kadar P ₂ O ₅	Rp165.000	Rp49.500	Rp214.500
5	Kadar K ₂ O	Rp114.000	Rp34.200	Rp148.200
6	Kadar Fe	Rp163.000	Rp48.900	Rp211.900
7	Kadar Co	Rp158.000	Rp47.400	Rp205.400
8	Kadar Mn	Rp164.000	Rp49.200	Rp213.200
9	Kadar Cu	Rp163.000	Rp48.900	Rp211.900

Analisis Kewirausahaan



No.	Parameter Uji	Harga Bahan	Laba	Biaya Analisis
10	Kadar Zn	Rp163.000	Rp48.900	Rp211.900
11	Kadar As	Rp157.000	Rp47.100	Rp204.100
12	Kadar Cd	Rp166.000	Rp49.800	Rp215.800
13	Kadar Hg	Rp105.000	Rp31.500	Rp136.500
14	Kadar Pb	Rp164.000	Rp49.200	Rp213.200
15	Total Coliform	Rp53.000	Rp15.900	Rp68.900
16	Uji <i>E. coli</i>	Rp15.000	Rp4.500	Rp19.500
17	Uji <i>Salmonella sp.</i>	Rp52.000	Rp15.600	Rp67.600
Total		Rp1.947.000	Rp584.100	Rp2.531.100

KESIMPULAN DAN SARAN





Kesimpulan

- + Hasil analisis yang didapat dari parameter logam berat, pH, dan mikroba kontaminan semuanya masuk ke dalam persyaratan standar, sedangkan untuk parameter unsur hara mikro, C-organik,unsur hara makro ,tidak sesuai dengan persyaratan standar.dapat disimpulkan bahwa produk pupuk yang dianalisis tetap layak digunakan.





Saran

- Kandungan unsur hara makro dan mikro lebih diperkaya lagi
- pada label kemasan harap cantumkan dosis pemakaian pupuk tersebut.



THANK
YOU



Slide Penunjang

Pewarnaan Gram

pH

C Organik

Hara Makro N

Hara Makro P

Hara Makro K

E.Coli

Cemaran As

Cemaran Hg

Total Coliform

Hara Mikro
(Fe,Cu,Zn,Mn,Co)
dan Cemaran Pb
dan Cd

Salmonella

A decorative vertical illustration of a plant with green leaves, yellow flowers, and small brown seed pods, positioned along the right edge of the slide.

Back (D)



C - Organik

Prinsip

Reaksi

Bagan Kerja

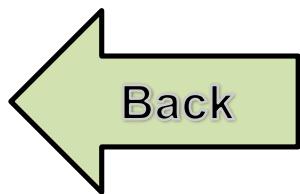
Perhitungan

Kewirausahaan



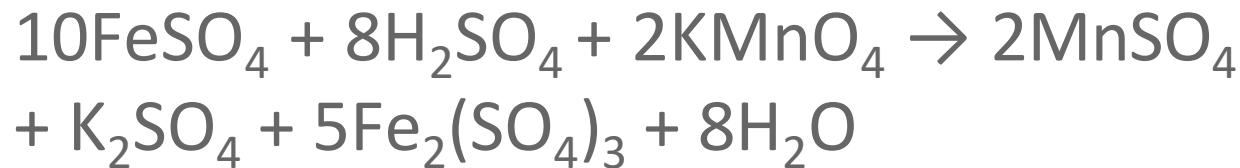
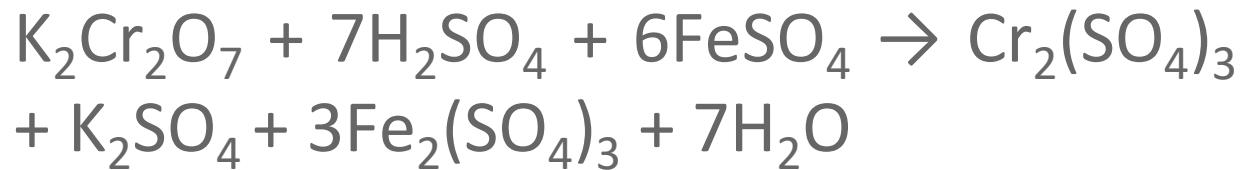
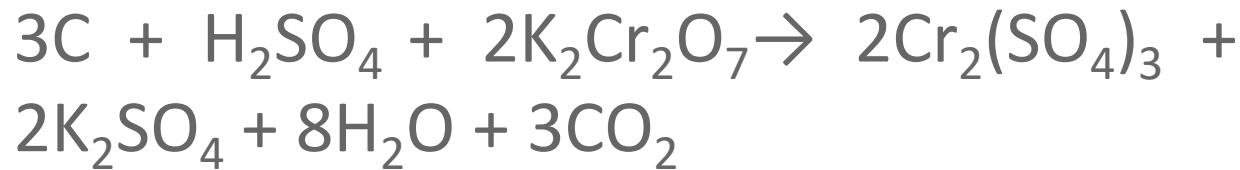
Prinsip

Karbon (C) organik direaksikan dengan kalium dikromat berlebih dan asam sulfat pekat. Kelebihan kalium dikromat direduksi dengan larutan fero sulfat berlebih terukur lalu sisa fero sulfat akan dititrasi dengan kalium permanganat hingga titik akhir larutan lembayung, dilakukan blanko.





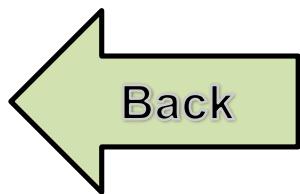
Reaksi





Perhitungan

$$\% \text{C organik} = \frac{(V_{\text{blanko}} - V_p) \times N_p \times F_p \times Bst \ C}{\text{mg contoh}} \times 100\%$$



Cemaran Logam Hg



Prinsip

Reaksi

Bagan Kerja

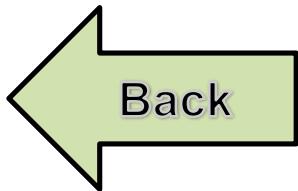
Pengolahan Data

Kewirausahaan



Prinsip

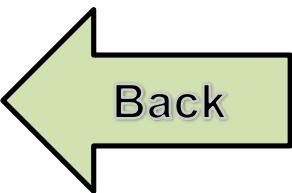
Merkuri dioksidasi dengan campuran asam kuat menjadi ion merkuri, kemudian direduksi dengan Natrium Borohidrat menjadi logam merkuri, dilanjutkan dengan analisis serapan atom hidrida pada panjang gelombang 253,7 nm.





Reaksi



 Back



Perhitungan

$$\text{ppm Hg} = \frac{\text{Abs contoh} - \text{Intersep}}{\text{slope}} \times \text{fp}$$

Back



Cemaran Logam As



Prinsip

Reaksi

Bagan Kerja

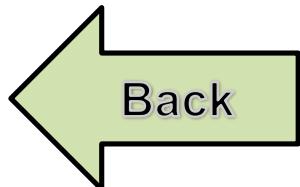
Pengolahan Data

Kewirausahaan



Prinsip

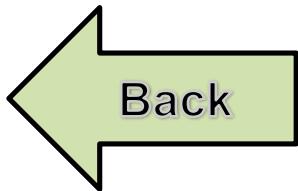
Arsen dioksidasi dengan campuran asam kuat menjadi ion Arsen, kemudian direaksikan dengan Natrium Borohidrat menjadi Senyawa Arsen Trihidrida, dilanjutkan dengan analisis serapan atom hidrida pada panjang gelombang 193,7 nm.





Reaksi



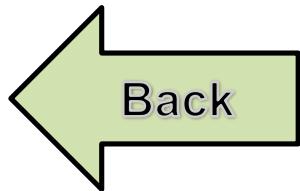
 Back





Perhitungan

$$ppm\ As = \frac{Abs\ contoh - Intersep}{slope} \times fp$$



Cemaran Logam Pb , Cd dan Hara Mikro Fe,Cu,Mn,Zn,Co



Prinsip

Reaksi

Bagan Kerja

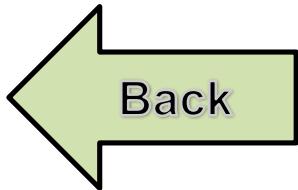
Pengolahan Data

Kewirausahaan



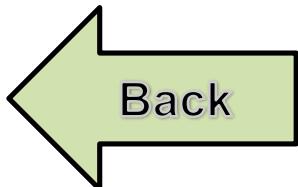
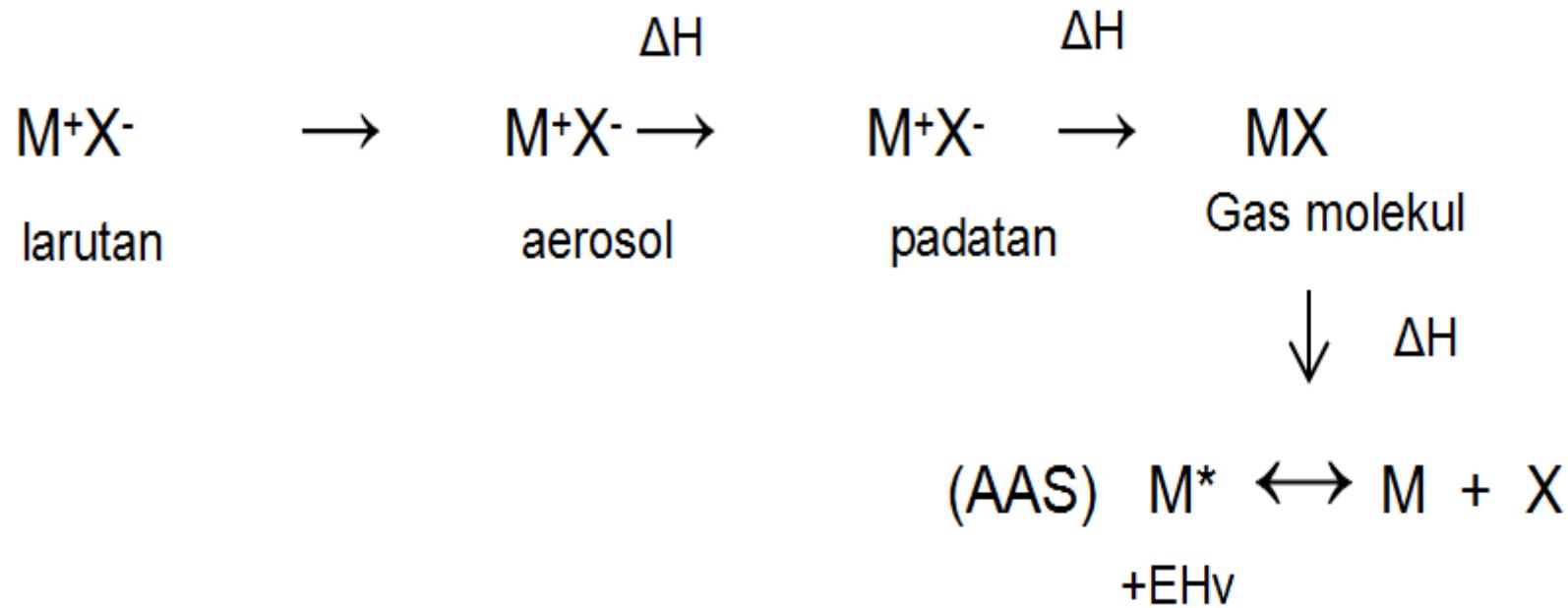
Prinsip

Sampel didestruksi menggunakan HNO_3 dan HClO_4 untuk menghilangkan kandungan zat organik dalam sampel sehingga hanya menyisakan logam logam. Kandungan logam dalam sampel dapat dianalisis dengan SSA dimana sampel dapat memberikan serapan yang sebanding dengan jumlah logam dalam contoh.





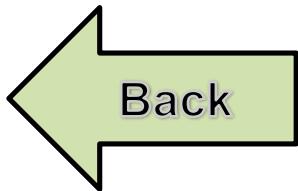
Reaksi





Perhitungan

$$ppm\ Logam = \frac{Abs\ contoh - Intersep}{slope} \times fp$$



pH

Prinsip

Reaksi

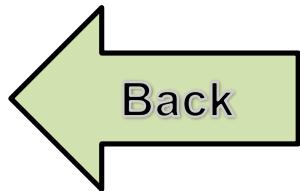
Bagan Kerja

Kewirausahaan



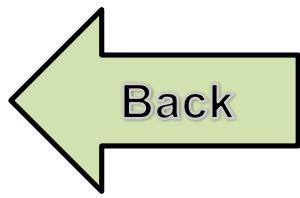
Prinsip

pH diukur berdasarkan pengukuran ion Hidrogen secara potensiometri menggunakan pH Meter dengan elektroda gelas sebagai Elektroda standar primer dan elektroda kalomel atau perak klorida sebagai elektroda pembanding.





NO REACTION



Hara Makro Nitrogen

Kewirausahaan

Pengolahan Data

Prinsip

Reaksi

Bagan Kerja

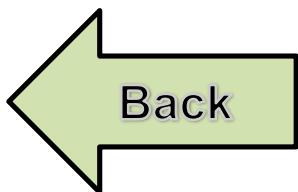


A decorative vertical vine with green leaves and small purple flowers runs along the right edge of the slide, partially obscuring the bottom text boxes.



Prinsip

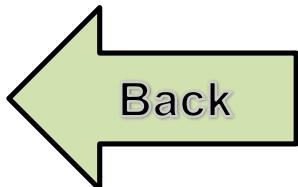
Contoh uji dihidrolisis menggunakan H_2SO_4 untuk mengkonversi nitrogen menjadi $(NH_4)_2SO_4$ dengan penambahan katalis Campuran Selen untuk mempercepat reaksi. Amonia dibebaskan melalui destilasi alkali dan secara kuantitatif ditentukan secara titrasi menggunakan larutan standar asam.





Reaksi



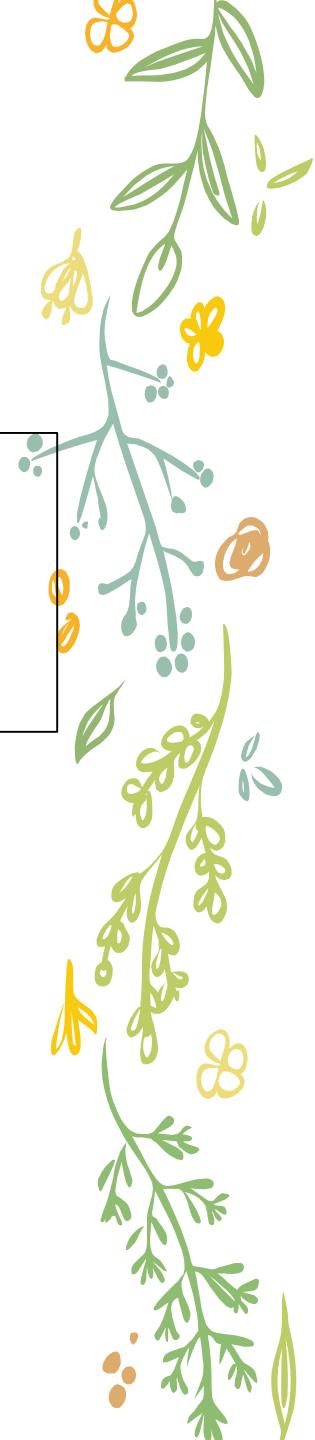
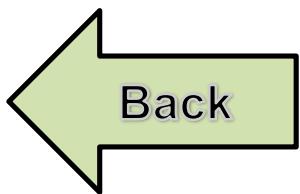
 Back



Perhitungan

$$\% \text{Nitrogen} = \frac{V_{\text{penitar}} \times N_{\text{penitar}} \times F_p \times Bst\ N}{\text{mg contoh}} \times 100\%$$

$$Bst\ N = 14/3$$





Hara Makro Fosfor sebagai P_2O_5

Prinsip

Reaksi

Bagan Kerja

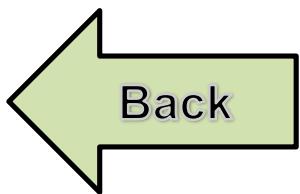
Pengolahan Data

Kewirausahaan



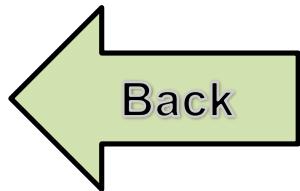
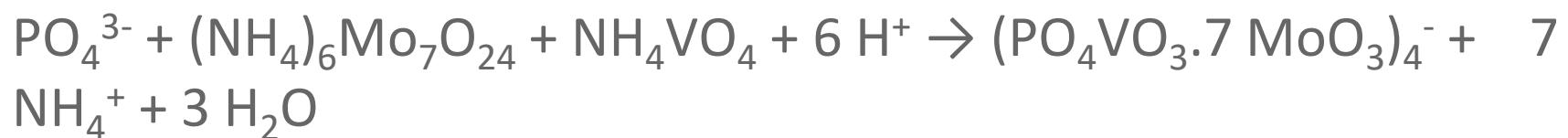
Prinsip

Sampel didestruksi menggunakan HNO_3 dan HClO_4 untuk mengkonversi Fosfor organik menjadi fosfat, fosfat yang dihasilkan lalu direaksikan dengan ammonium molibdat dan ammonium vanadat menghasilkan senyawa fosfomolibdovanadat berwarna kuning sehingga dapat diukur serapannya secara spektrofotometri pada panjang gelombang 400 nm.





Reaksi

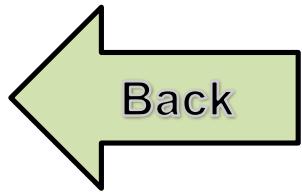




Perhitungan

$$\text{ppm PO}_4 = \frac{\text{Abs} - \text{Intersep}}{\text{Slope}} \times F_p$$

$$\%P_2O_5 = \frac{\text{ppm PO}_4 \times \left(\frac{V_{\text{labu}}}{1000}\right) \times 100\%}{\text{mg contoh}} \times \frac{P_2O_5}{PO_4}$$



Hara Makro Kalsium sebagai K_2O

Kewirausahaan

Prinsip

Reaksi

Bagan Kerja

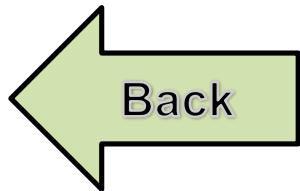
Pengolahan Data





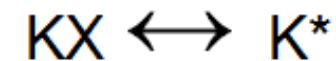
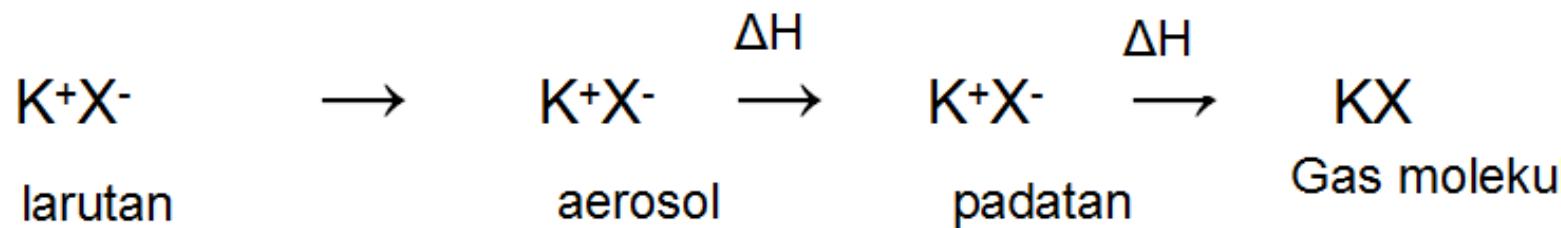
Prinsip

Sampel didestruksi dengan campuran asam untuk menghilangkan zat-zat organik yang terdapat didalam sampel menyisakan mineral mineral terlarut seperti K,dll. Kandungan K dalam sampel dapat dianalisis secara flamefotometer dimana sinar emisi yang dilepaskan akan sebanding dengan kandungan K dalam contoh.

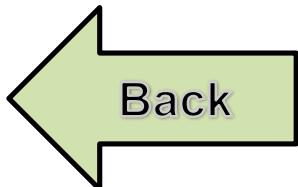




Reaksi



-Ehv (flame)





Perhitungan

$$\text{ppm K} = \frac{\% \text{E-Intersep}}{\text{Slope}} \times F_p$$

$$\% \text{K}_2\text{O} = \frac{\text{ppm K} \times \left(\frac{\text{Vlabu}}{1000} \right) \times 100\%}{\text{mg contoh}} \times F_k$$

$$F_k = \frac{\text{K}_2\text{O}}{2\text{K}}$$





Perhitungan jumlah Bakteri *coliform* secara APM

Prinsip

Bagan Kerja

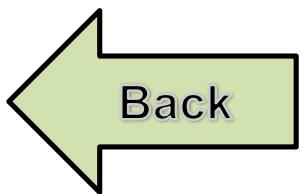
Kewirausahaan

Pengolahan Data



Prinsip

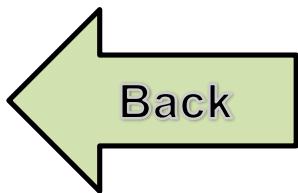
Perhitungan jumlah bakteri coliform dilakukan dengan pengenceran contoh 10^{-1} s.d 10^{-3} dan blanko kemudian dari masing – masing pengenceran dipipet sebanyak 1 ml kedalam tabung ulir berdurham yang berisi media *Brilliant Green Bile Broth (BGBB)* Steril lalu diinkubasi pada suhu 37°C selama ± 24 jam. Jumlah bakteri coliform dapat dihitung dengan melihat tabel indeks APM.





Pengolahan Data

Untuk menghitung jumlah bakteri coliform dalam sampel, digunakan tabel indeks APM sebagai berikut :

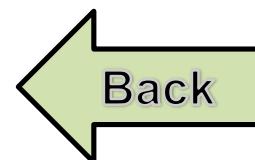


Pengolahan Data



Tabel MPN/APM Coliform per gram/ per ml (menggunakan 3 tabung)

Jumlah Tabung (+)			MPN/gram atau /ml
10^{-1}	10^{-2}	10^{-3}	
0	0	0	<3
0	0	1	3
0	1	0	3
1	0	0	4
1	0	1	7
1	1	0	7
1	1	1	11
1	2	0	11
2	0	0	9
2	0	1	14
2	1	0	15
2	1	1	20
2	2	0	21
2	2	1	28



Pengolahan Data

Tabel MPN/APM Coliform per gram/ per ml (menggunakan 3 tabung)

Jumlah Tabung (+)			MPN/gram atau /ml
10^{-1}	10^{-2}	10^{-3}	
3	0	0	23
3	0	1	39
3	0	2	64
3	1	0	43
3	1	1	75
3	1	2	120
3	2	0	93
3	2	1	150
3	2	2	210
3	3	0	240
3	3	1	460
3	3	2	1100
3	3	3	>2400

Back

Pewarnaan Gram

Prinsip

Bagan Kerja

Pengamatan





Prinsip

Untuk memastikan keberadaan bakteri coliform dalam sampel, dilakukan pewarnaan gram dengan mengoleskan hasil uji coliform yang positif kedalam kaca alas datar yang kemudian ditambahkan zat warna *Crystal Violet* kemudian ditambahkan lugol dan Larutan *Decolourizer* lalu ditambahkan zat warna *Safranin* kemudian diamati pada mikroskop pada perbesaran 1000x, bakteri coliform umumnya bersifat Gram Negatif dan memiliki bentuk *cocobacillus* (batang pendek) dan berwarna Merah





Hasil Pengamatan

Keberadaan bakteri coliform dapat dipastikan apabila pada saat pengamatan, terdapat koloni bakteri dengan bentuk *cocobacillus* (batang pendek) berwarna merah (gram negatif).





Uji Kualitatif Bakteri *Salmonella sp*



Kewirausahaan

Prinsip

Bagan Kerja

Pengamatan



Prinsip

Pemeriksaan bakteri patogen *Salmonella sp* dilakukan dengan memipet sampel yang sudah diencerkan 10x (sampel pengenceran 10^{-1}) kedalam 2 media selektif *Brilliant Green Agar (BGA)* dan *Lysine Iron Agar (LIA)* steril lalu diinkubasi pada suhu 37°C selama ± 24 jam.





Hasil Pengamatan

Spesifikasi koloni *salmonella sp* pada media selektif :

BGA : Koloni kecil transparan tidak berwarna atau pink s.d putih terkadang dikelilingi zona pink sampai merah

LIA : Koloni Ungu Tua



Hasil pengamatan



Hasil pengamatan *Salmonella sp.* pada media BGA dan LIA



Uji Kualitatif Bakteri *E.coli*

Kewirausahaan

Prinsip

Bagan Kerja

Pengamatan





Prinsip

Pemeriksaan bakteri patogen *E.Coli* dilakukan dengan memipet sampel yang sudah diencerkan 10x (sampel pengenceran 10^{-1}) kedalam media selektif *Mac Conkey Agar (MCA)* steril lalu diinkubasi pada suhu 37°C selama ±24 jam.





Hasil Pengamatan

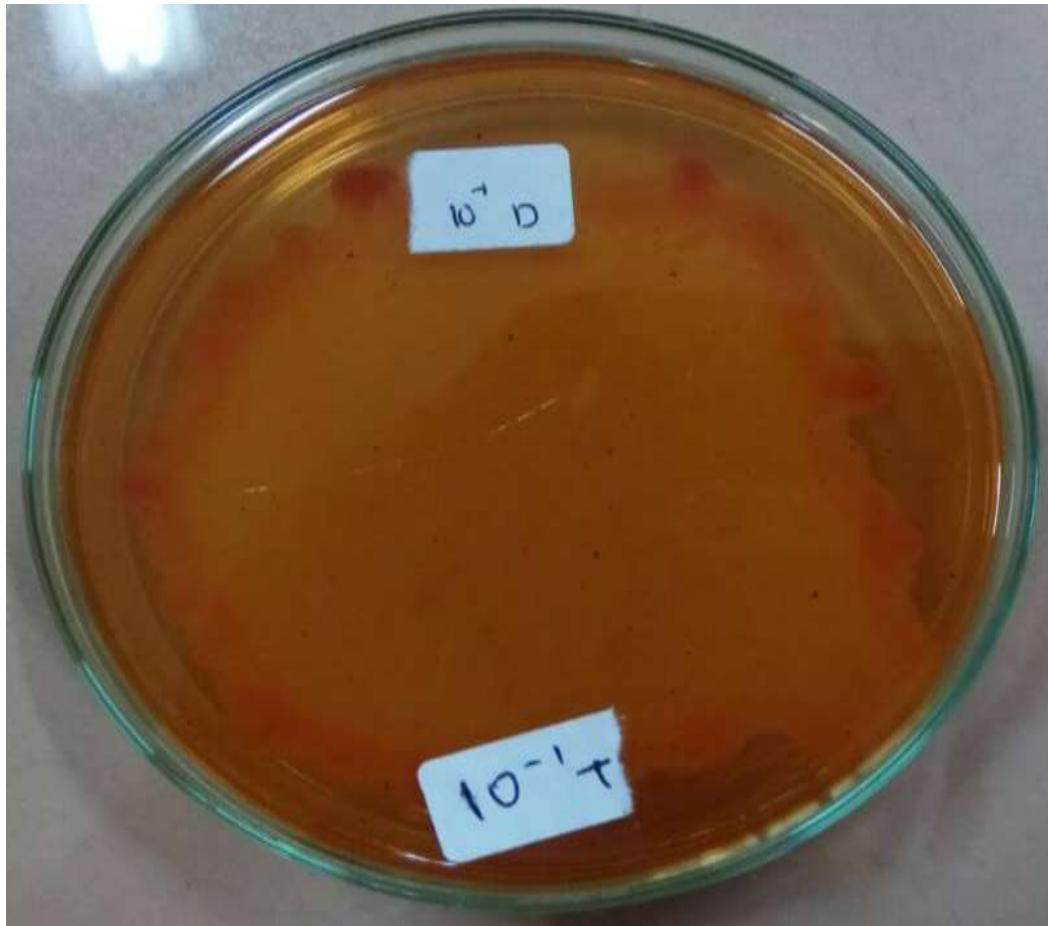
Spesifikasi Koloni *E.Coli* pada media selektif

:

MCA : Koloni merah keunguan



Hasil pengamatan



Hasil pengamatan *E. coli* pada media MCA



C organik

pH

As

Hg

N

Bagan Kerja



Pewarnaan
Gram

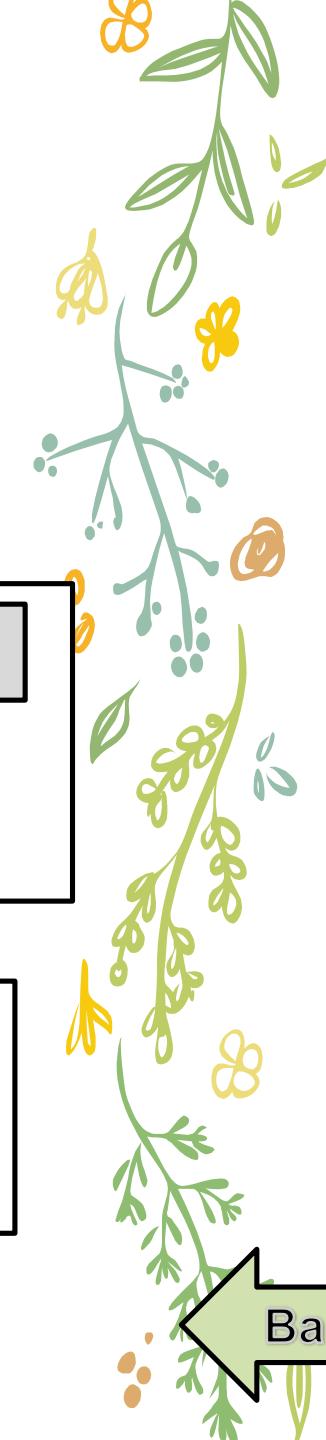
P

K

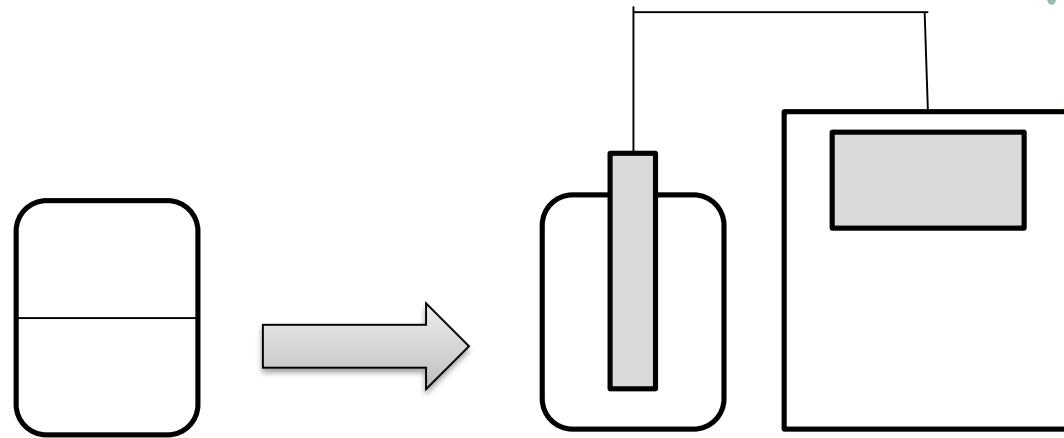
Coliform,
Salmonella &
E.Coli

Fe, Cu,
Pb, Cd,
Mn, Co,
Zn





Bagan Kerja pH meter



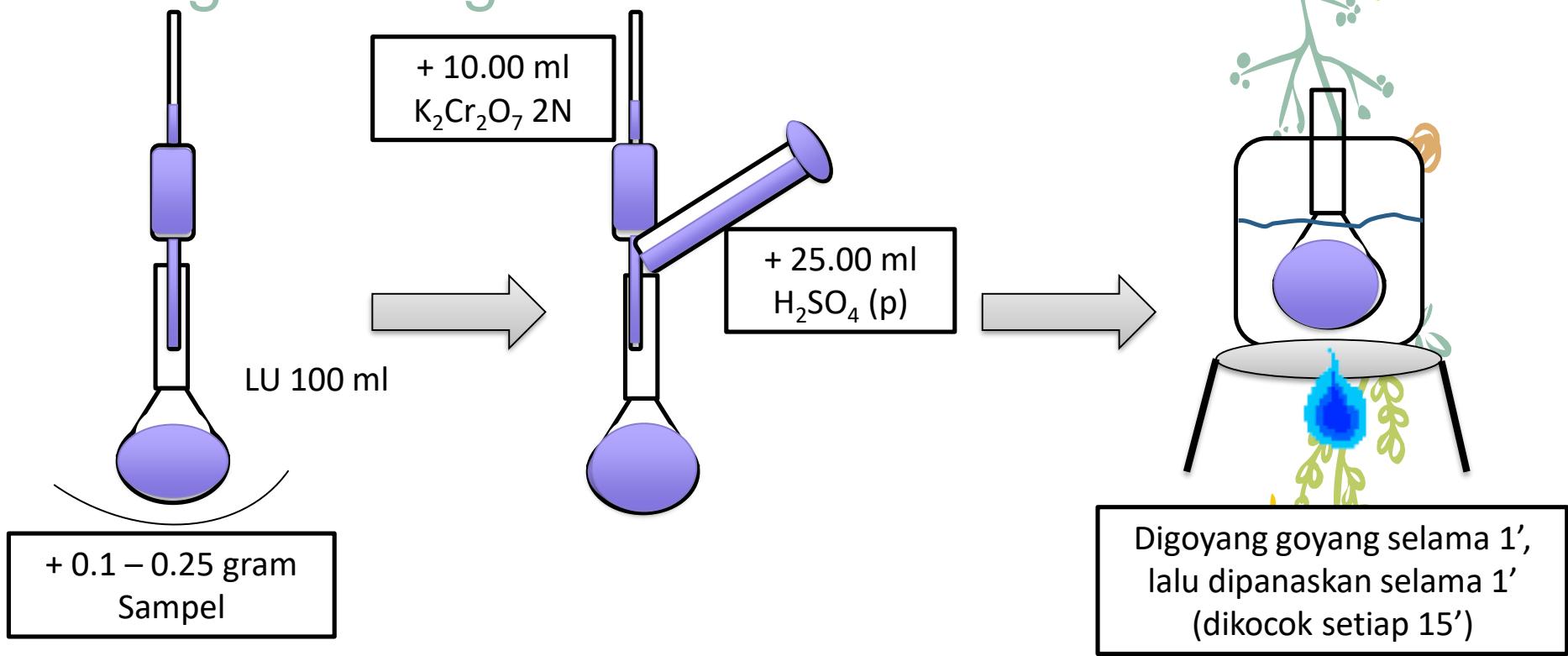
Sampel

pH Meter yang
sudah dikalibrasi
dengan buffer pH
4 dan 7

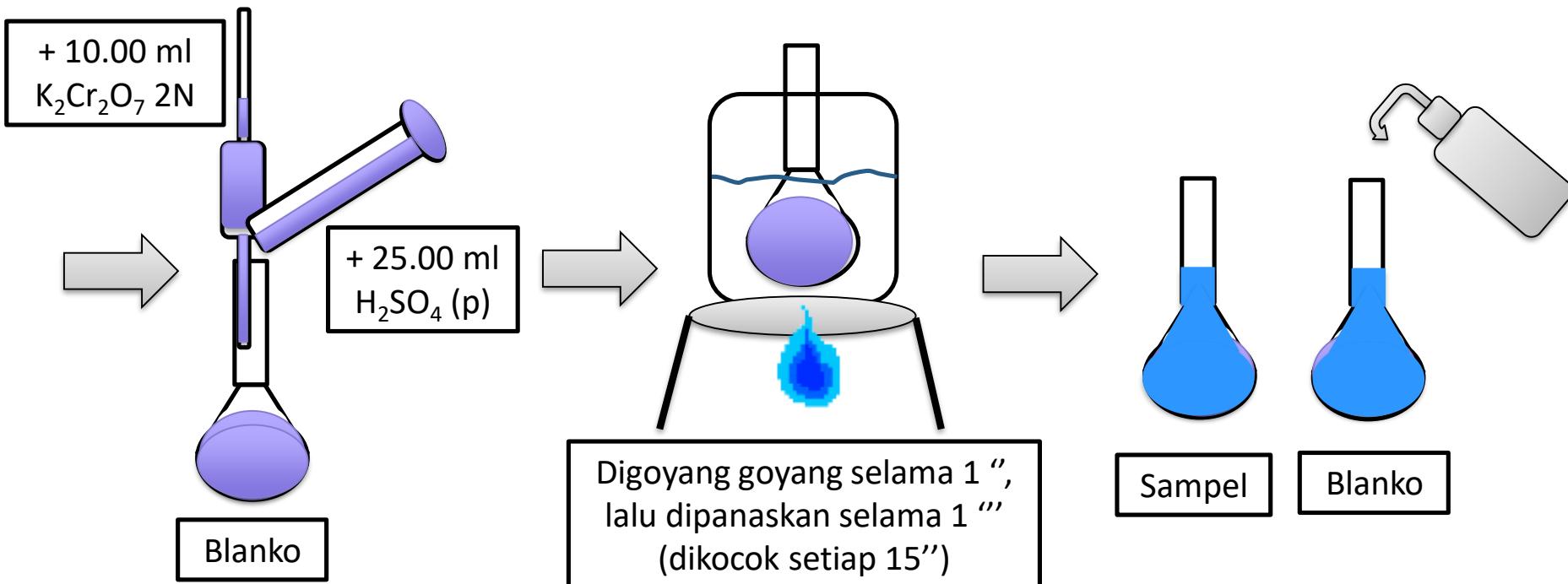


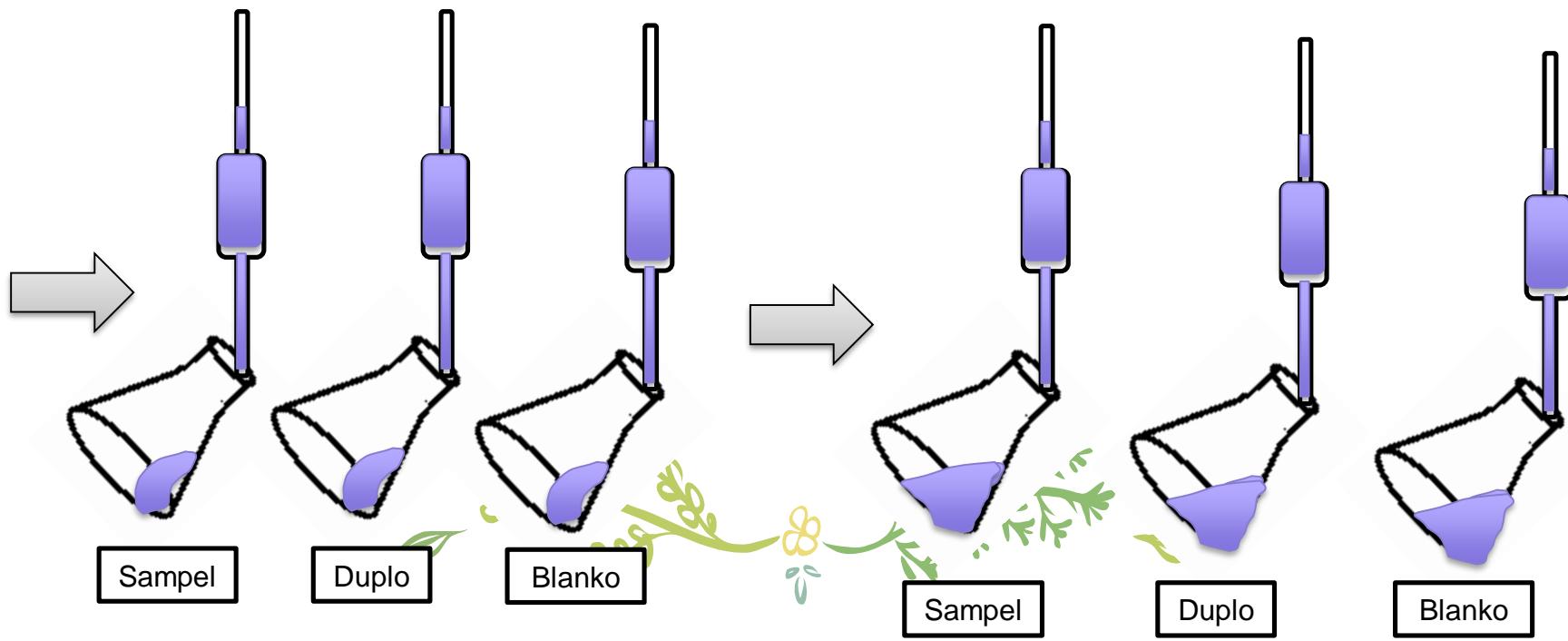
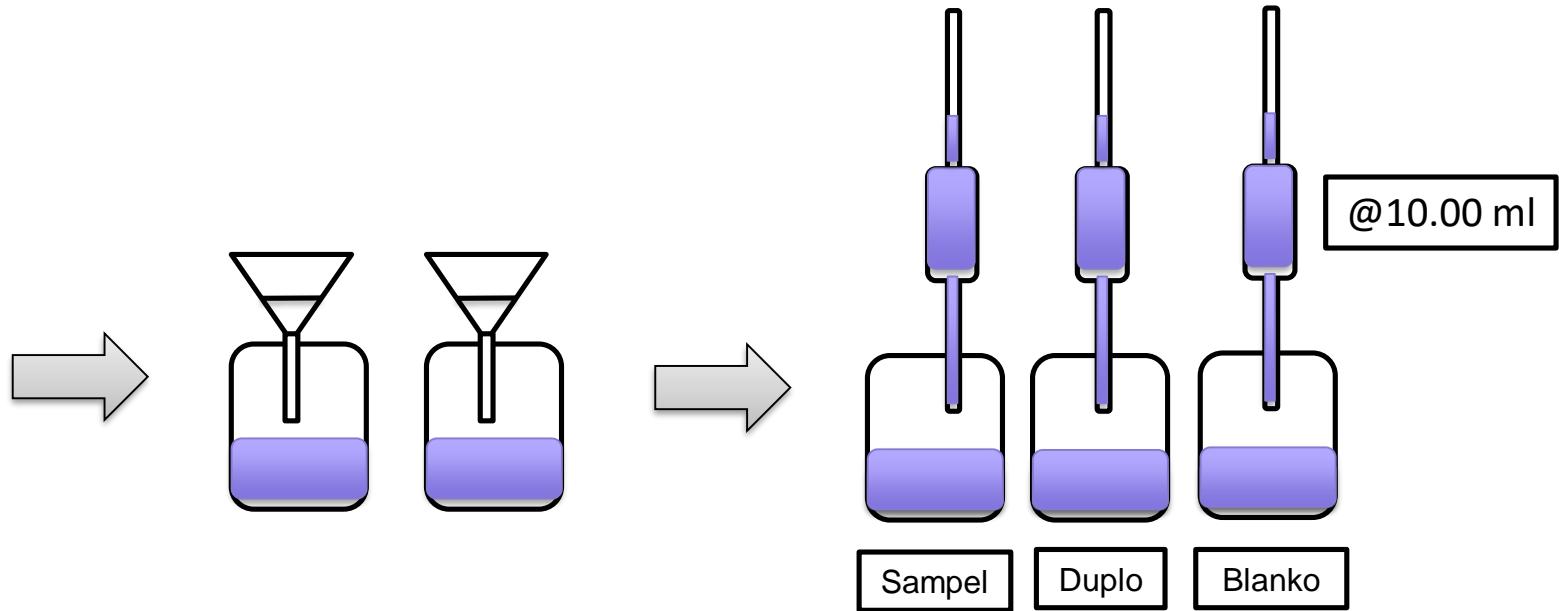
Back

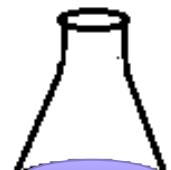
Bagan C-Organik



Back



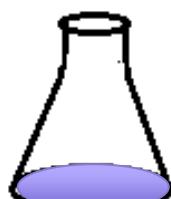




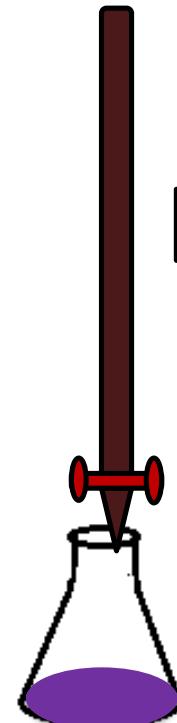
Sampel



Duplo



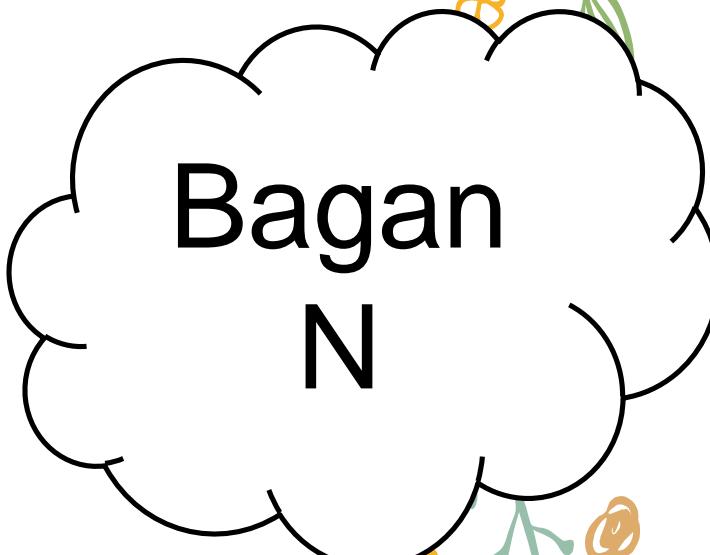
Blanko



KMnO₄ 0.1N

Titik Akhir : Lembayung

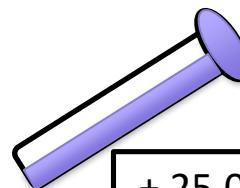
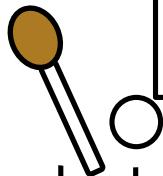




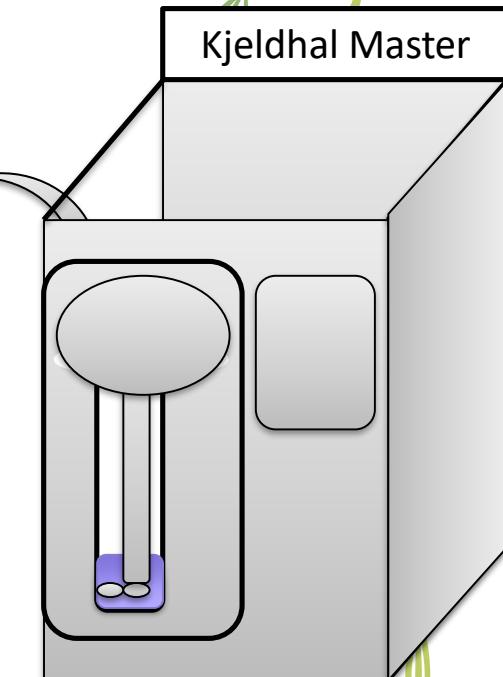
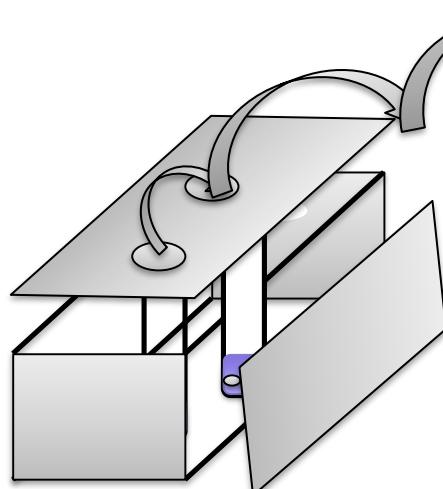
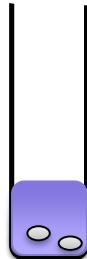
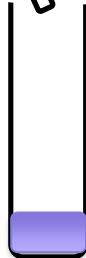
Bagan N

+ 1-2 gram
sampel

+ 1 – 2 gram
Camp. Selen



+ 25.00 ml
 H_2SO_4 (p)

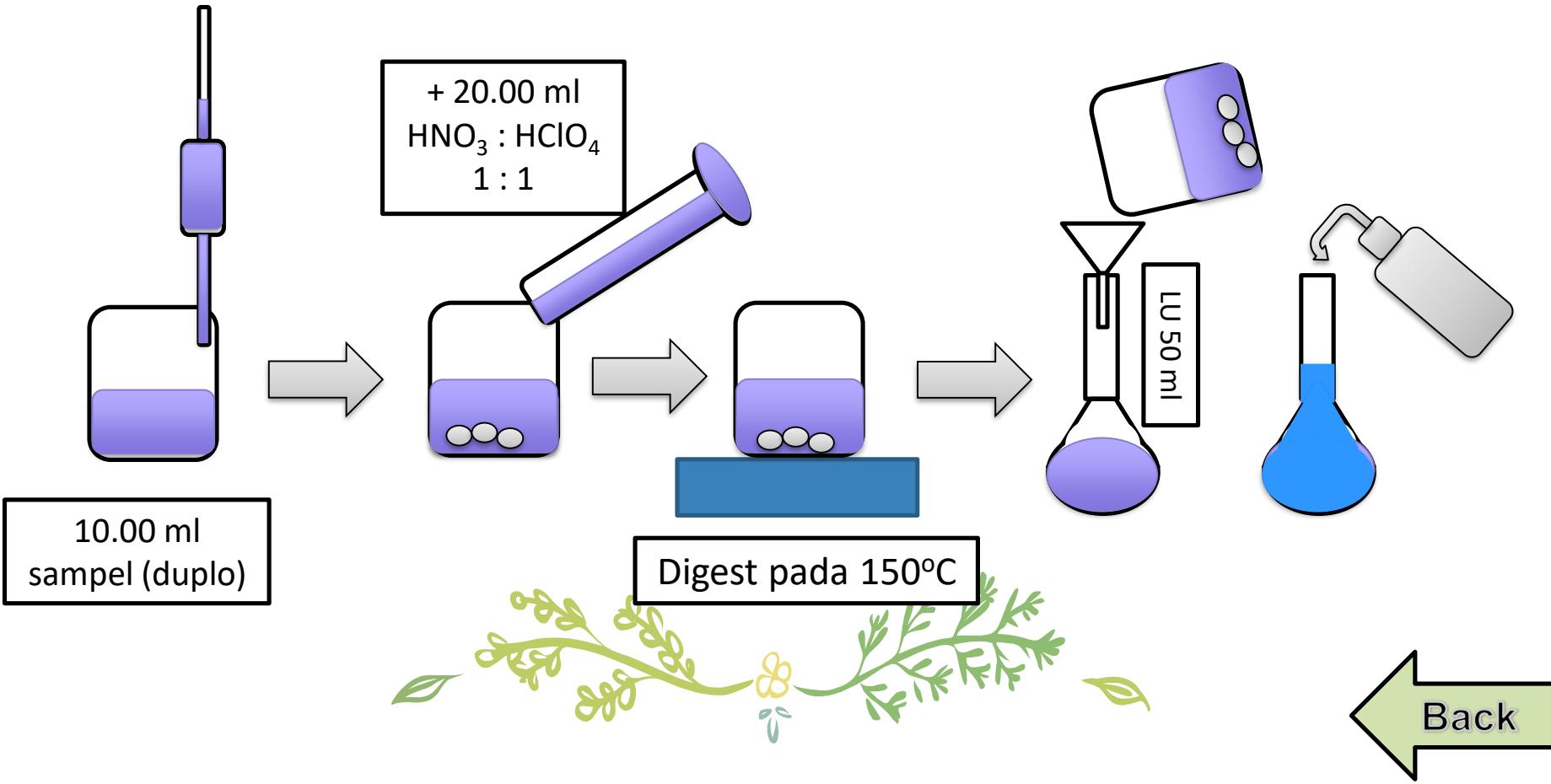


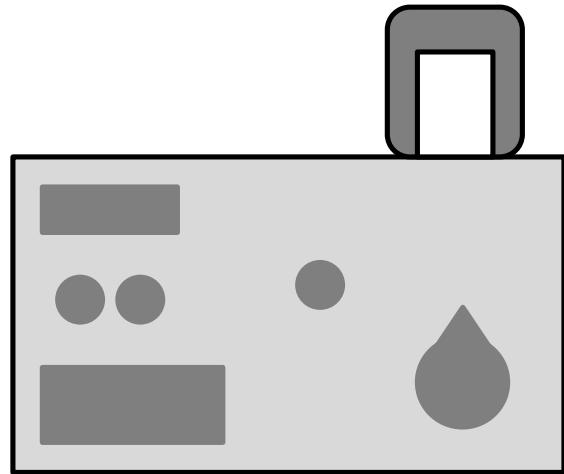
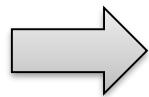
Kjeldhal Master

Back

Bagan K

Preparasi Sampel

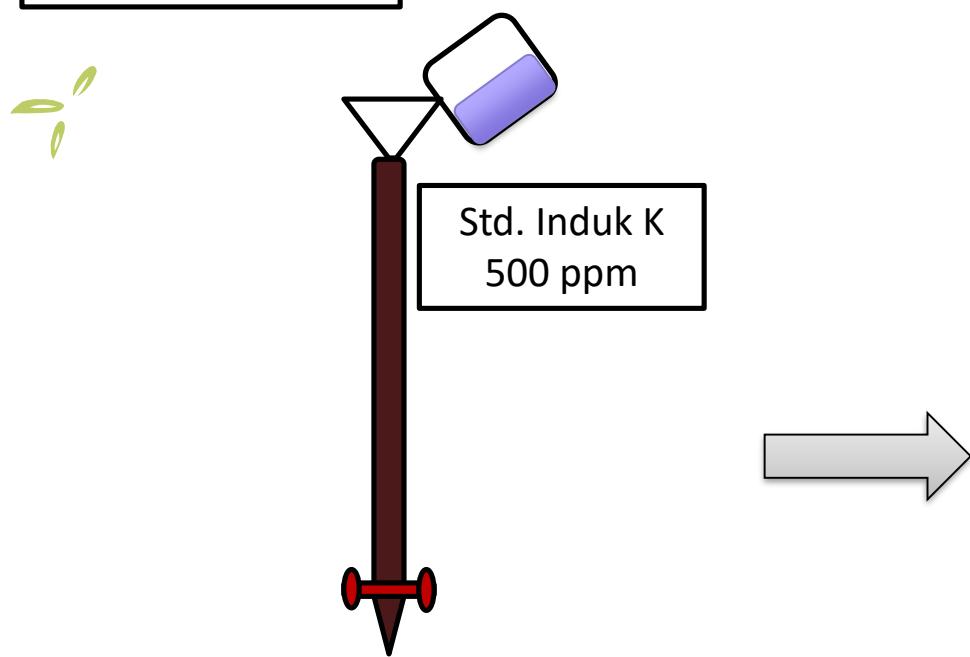


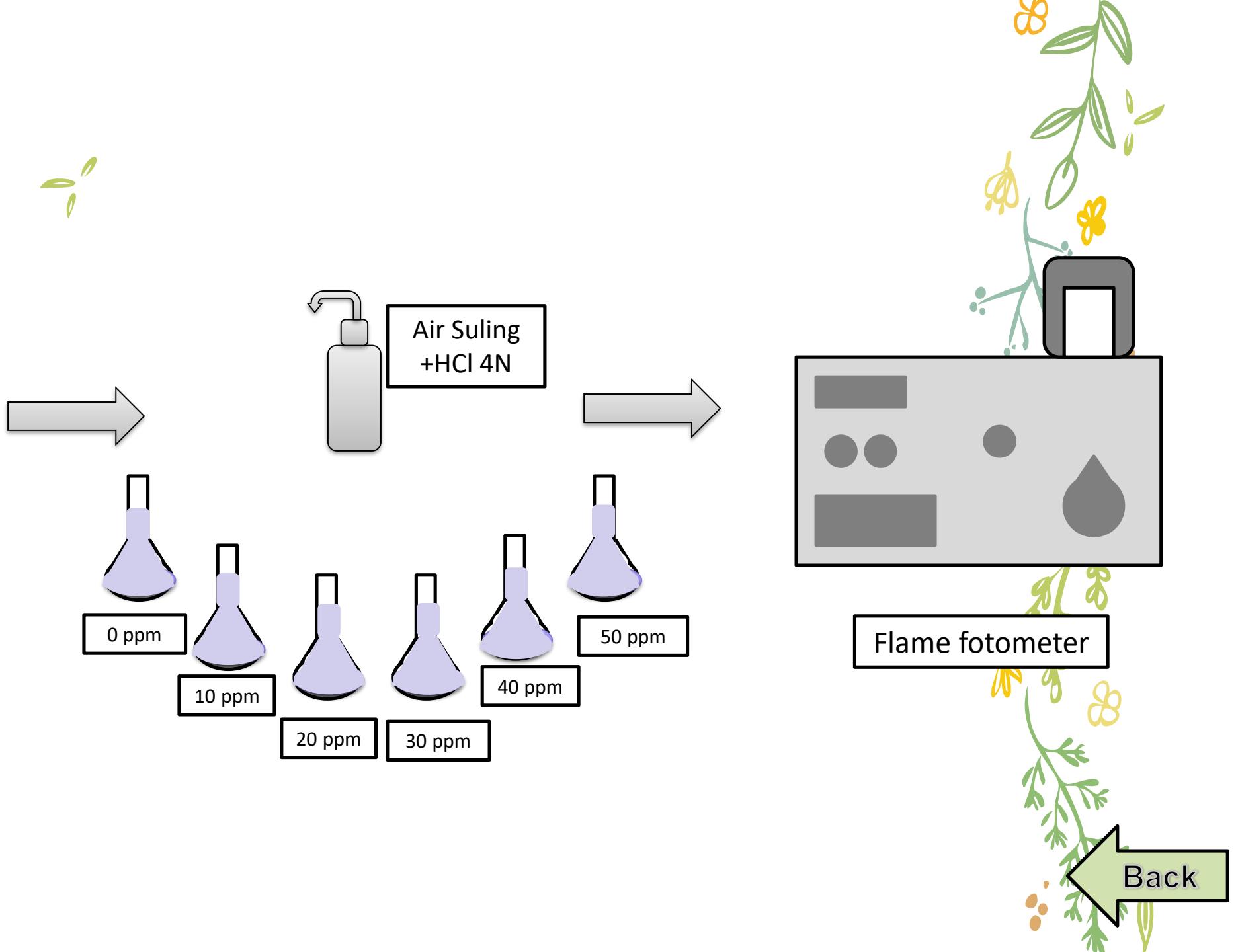


Flame fotometer



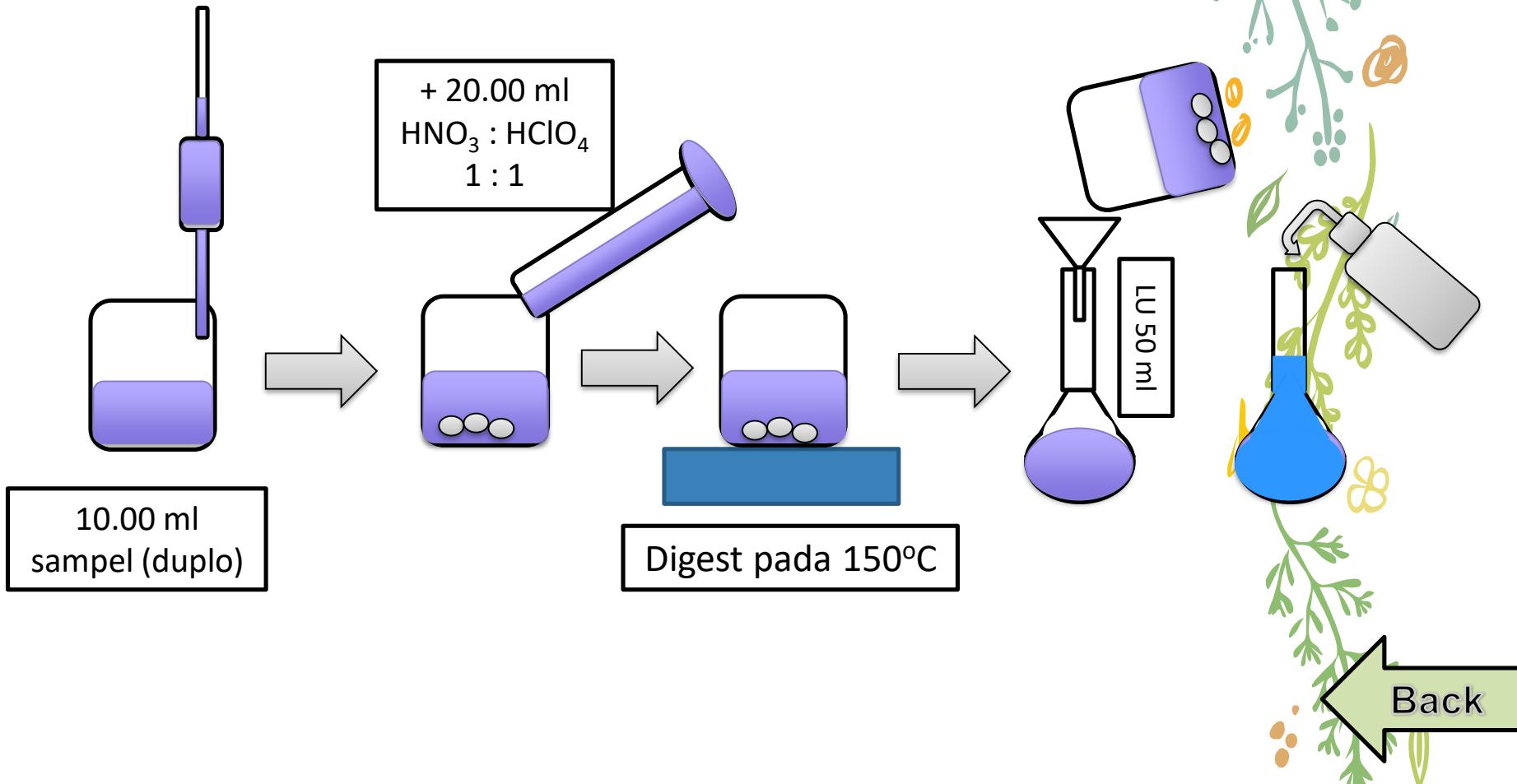
Deret Standar

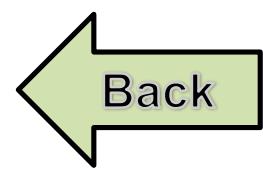
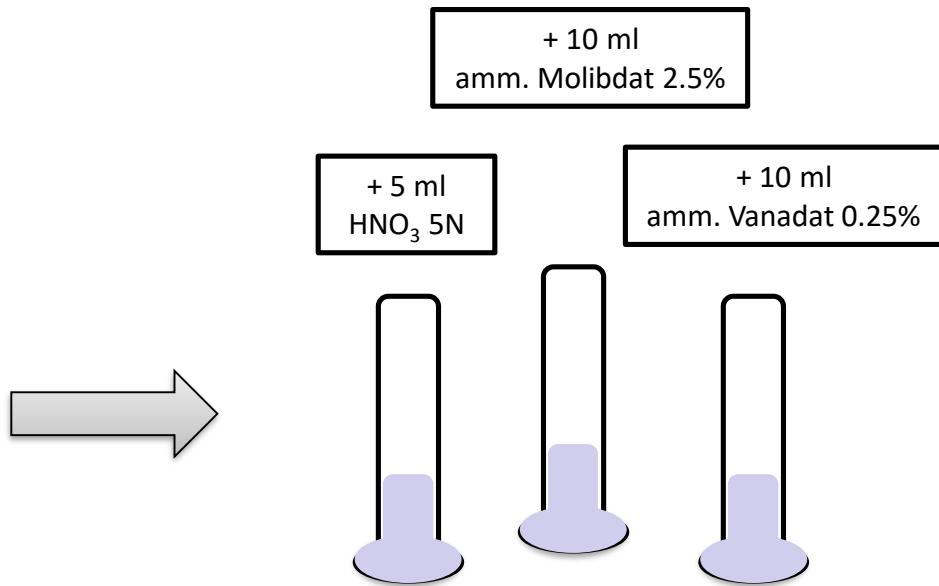


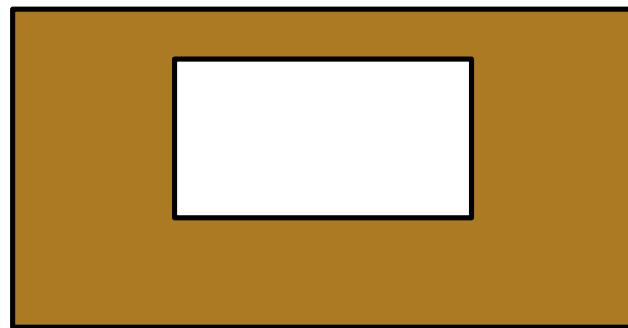
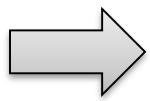


Bagan P

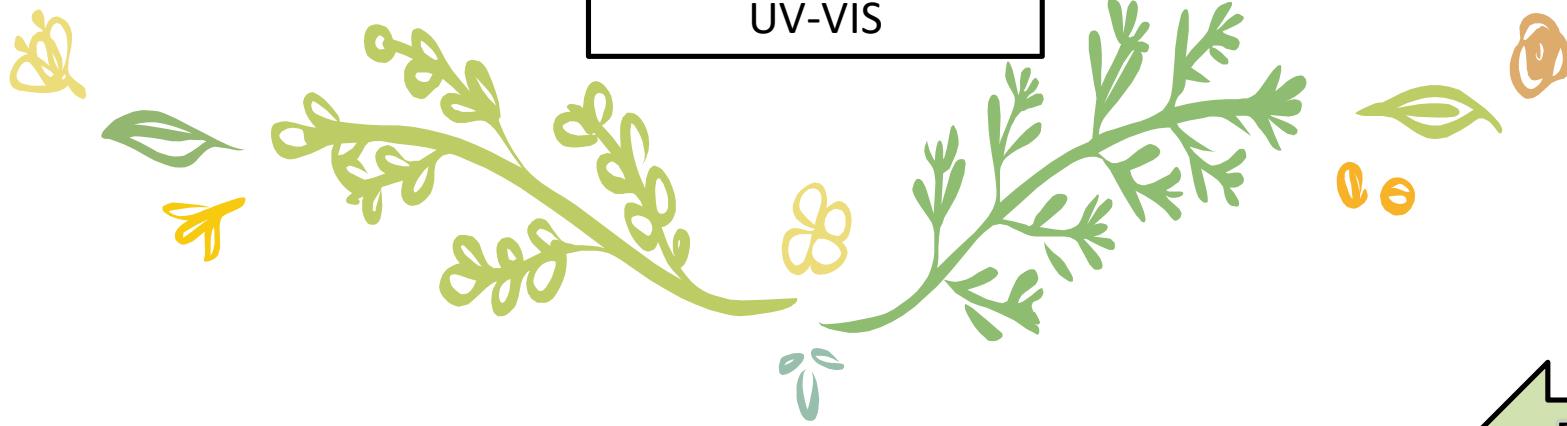
Preparasi Sampel



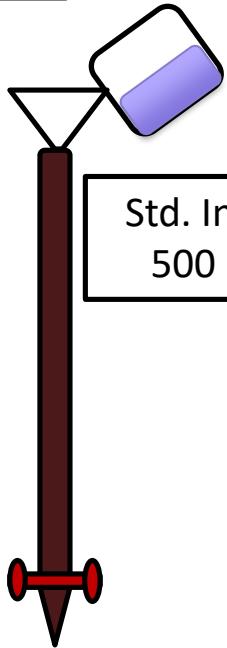




Spektrofotometer
UV-VIS



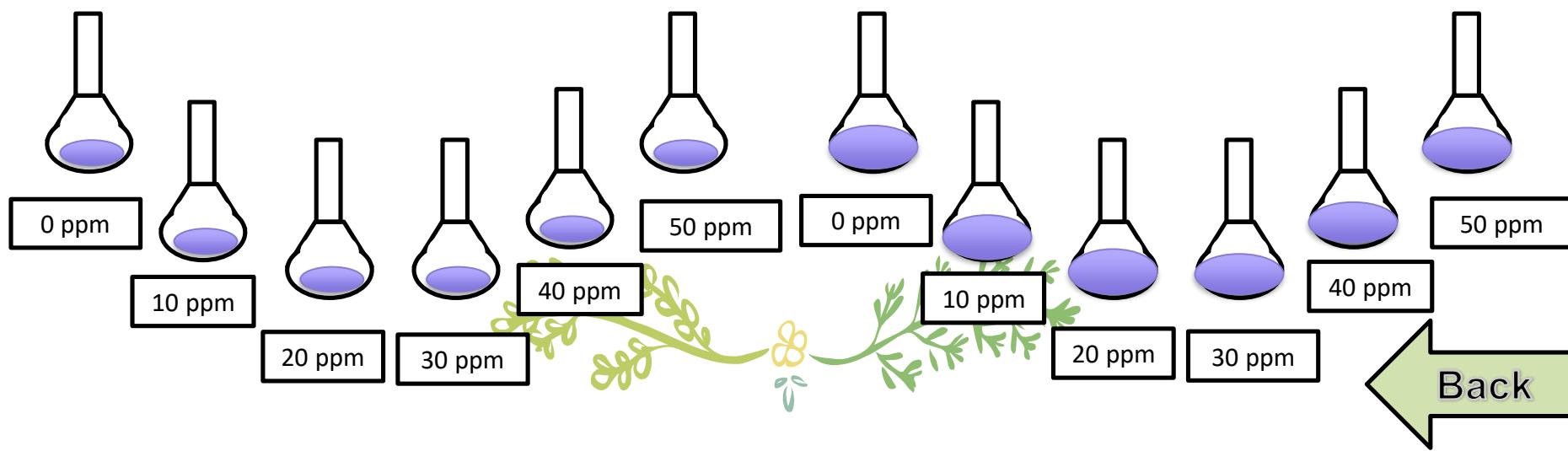
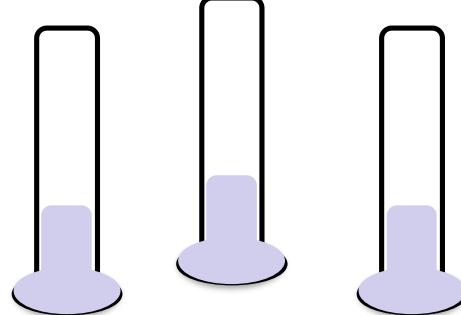
Deret Standar

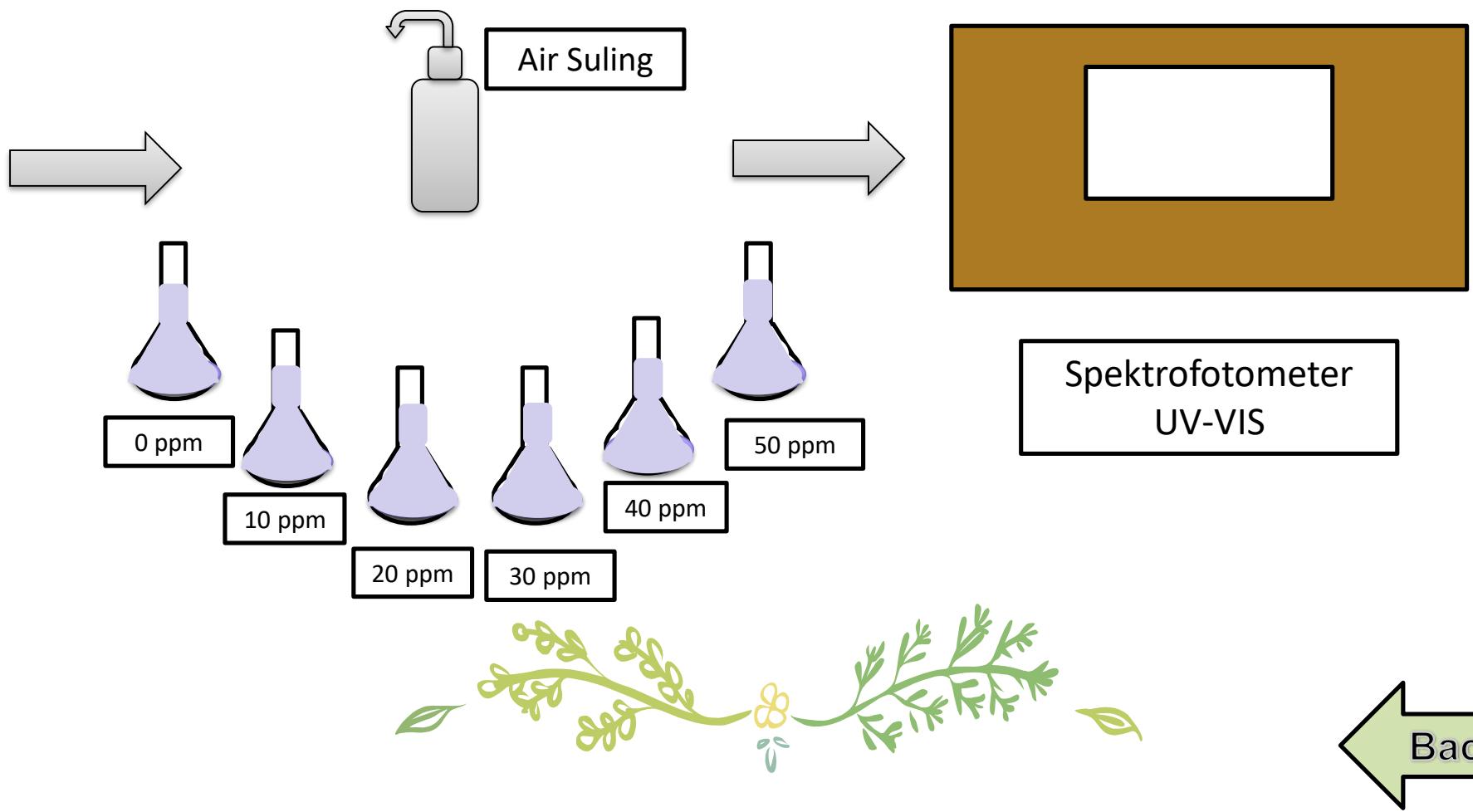


+ 10 ml
amm. Molibdat 2.5%

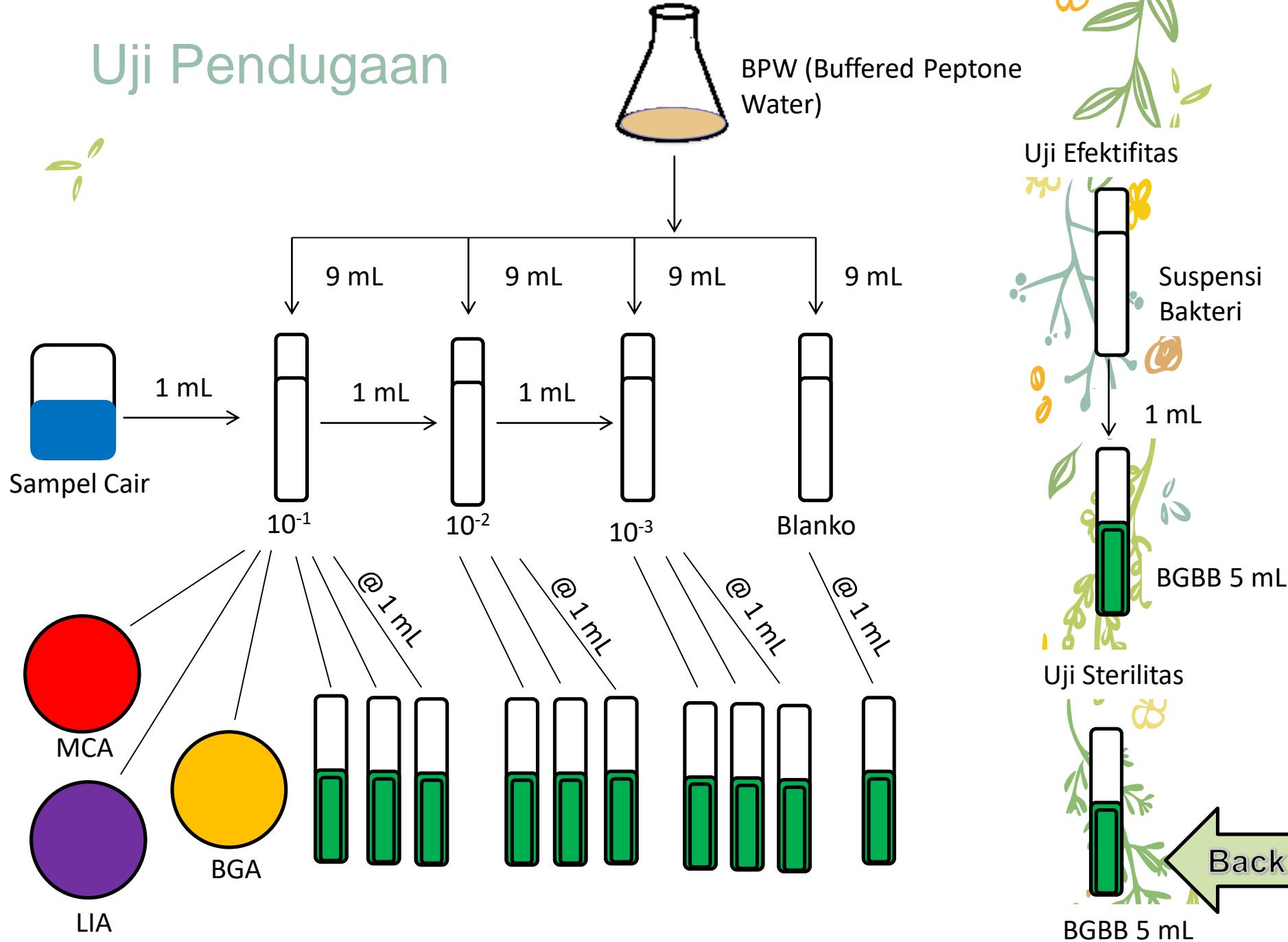
+ 5 ml
 HNO_3 5N

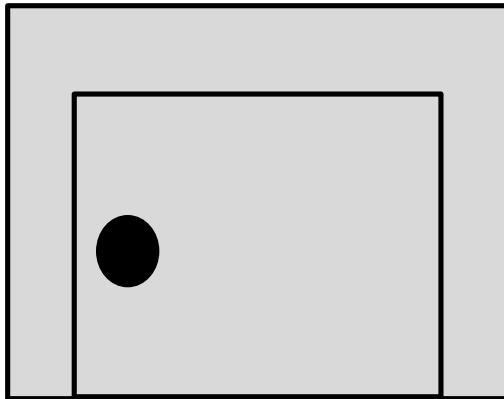
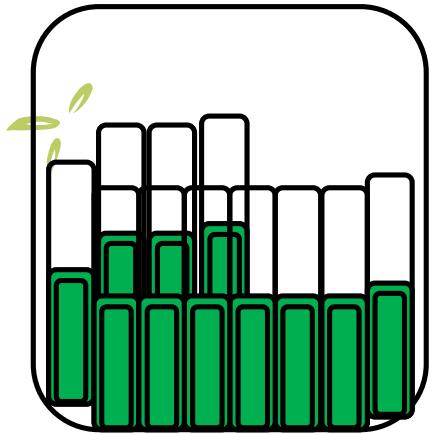
+ 10 ml
amm. Vanadat 0.25%





Uji Pendugaan





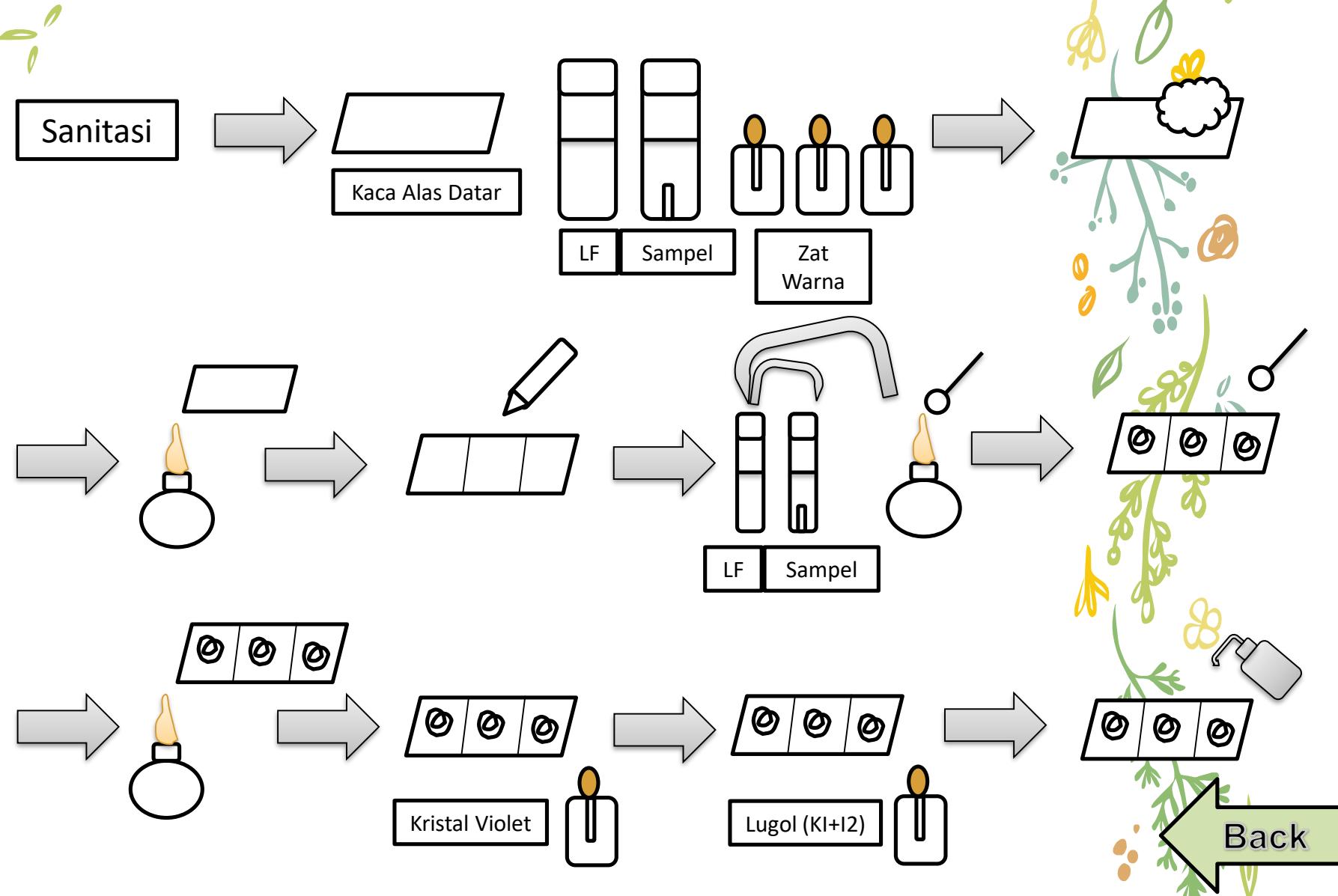
Diinkubasi pada suhu
37°C dan waktu 24 jam

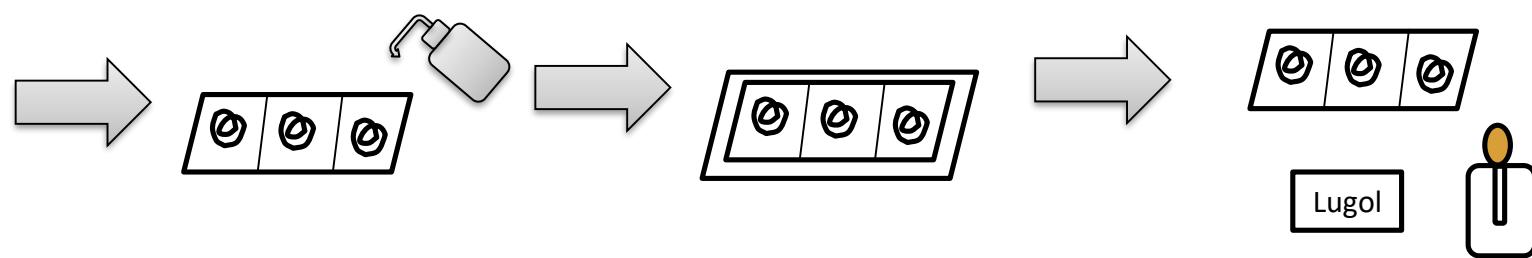
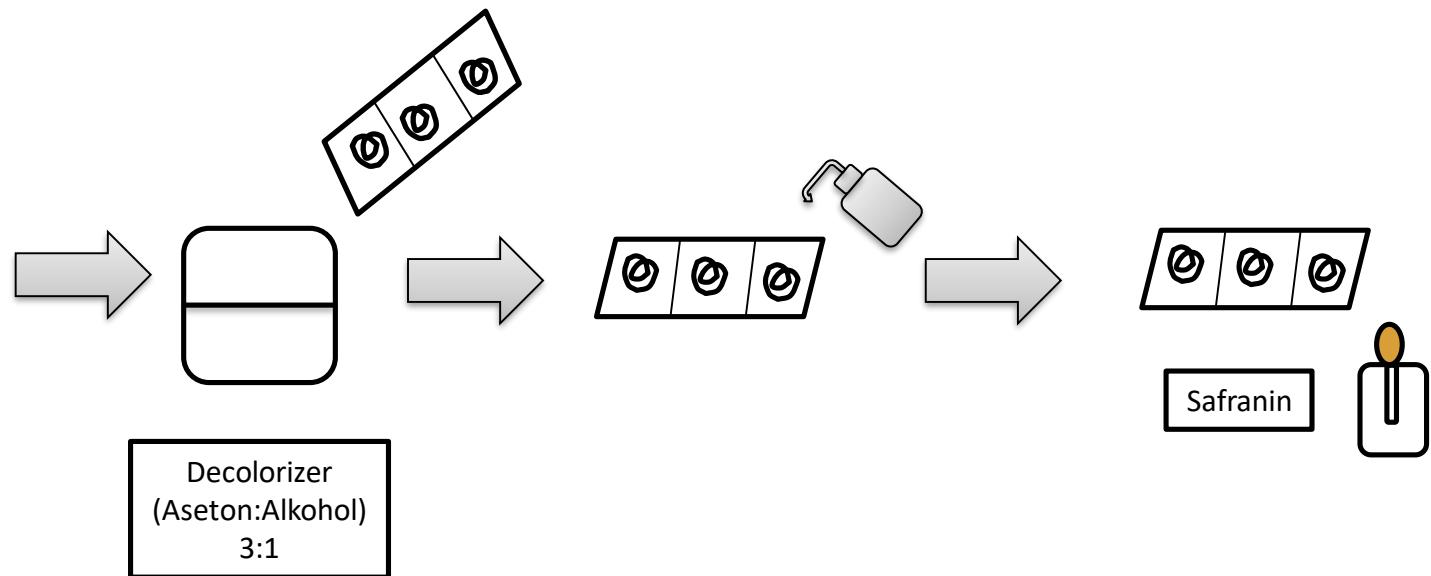


Diamati gas yang
terbentuk di dalam
tabung Durham
Hasil (+) bila terbentuk
gas dan terdapat
kekeruhan.



Pewarnaan Gram

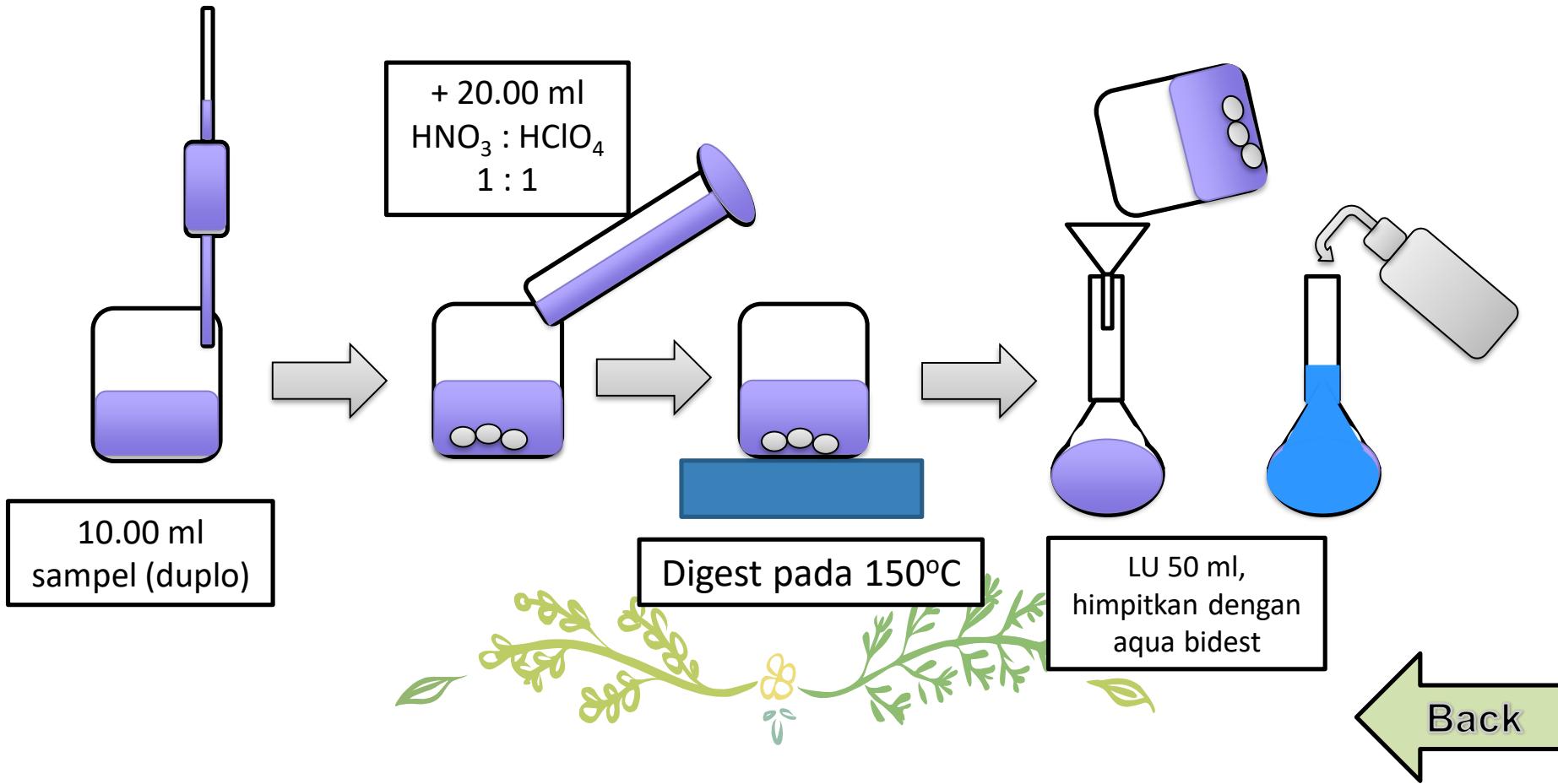


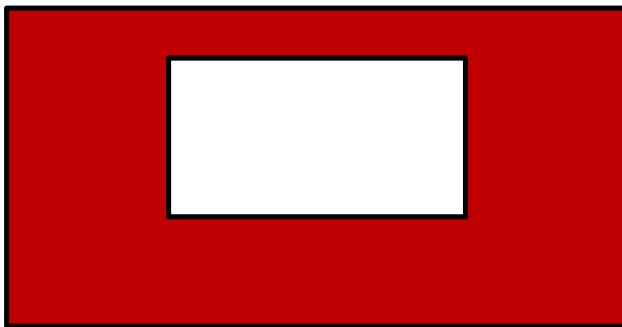
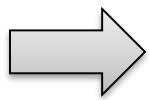


Back

Bagan Logam Pb,Cd,Co,fe,Cu,Mn,Zn

Preparasi Sampel





AAS sistem Atomisasi
Nyala

Persiapan Standar

Pb

Cd

Fe

Co

Mn

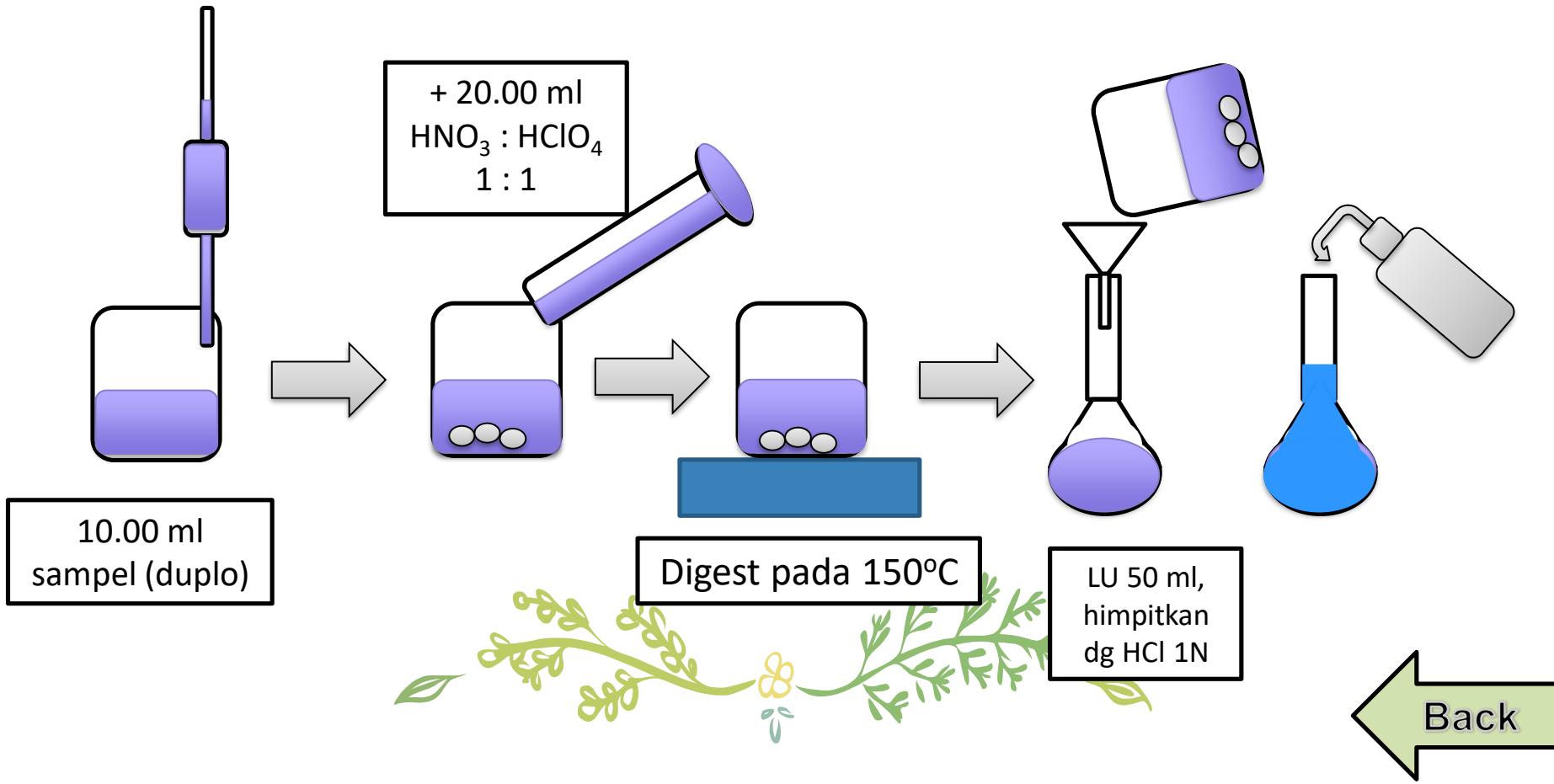
Zn

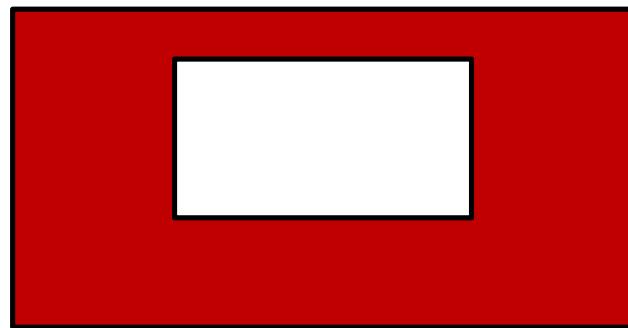
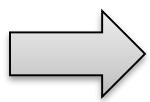
Cu

Back

Bagan Logam As

Preparasi Sampel



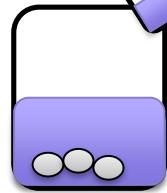
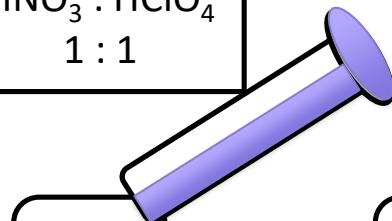


AAS Hidrida

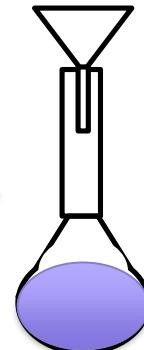
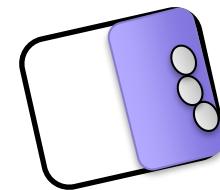
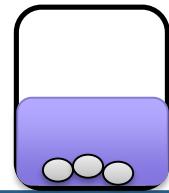
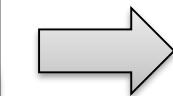


Blanko Koreksi

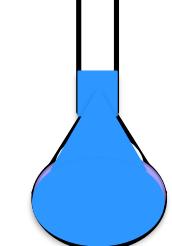
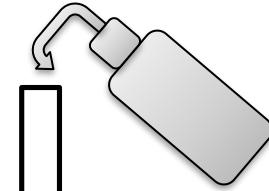
+ 20.00 ml
 $\text{HNO}_3 : \text{HClO}_4$
1 : 1



Digest pada 150°C

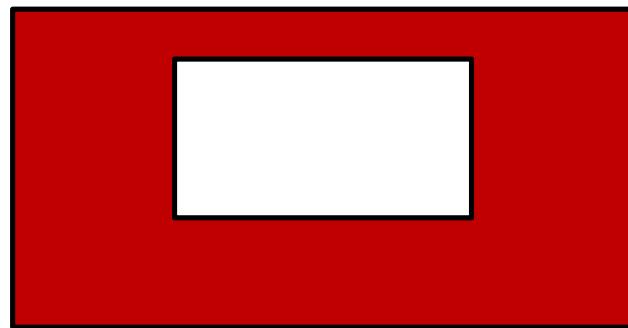
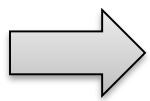


LU 50 ml,
himpitkan
dg HCl 1N

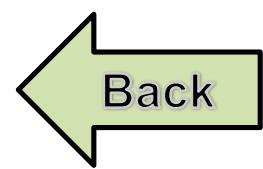
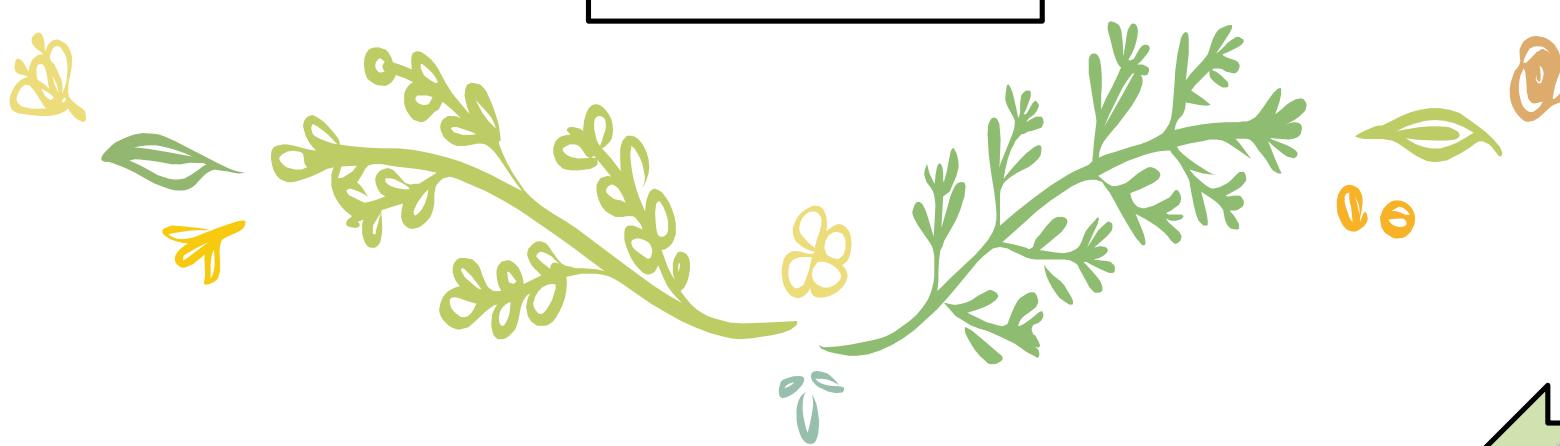


Back



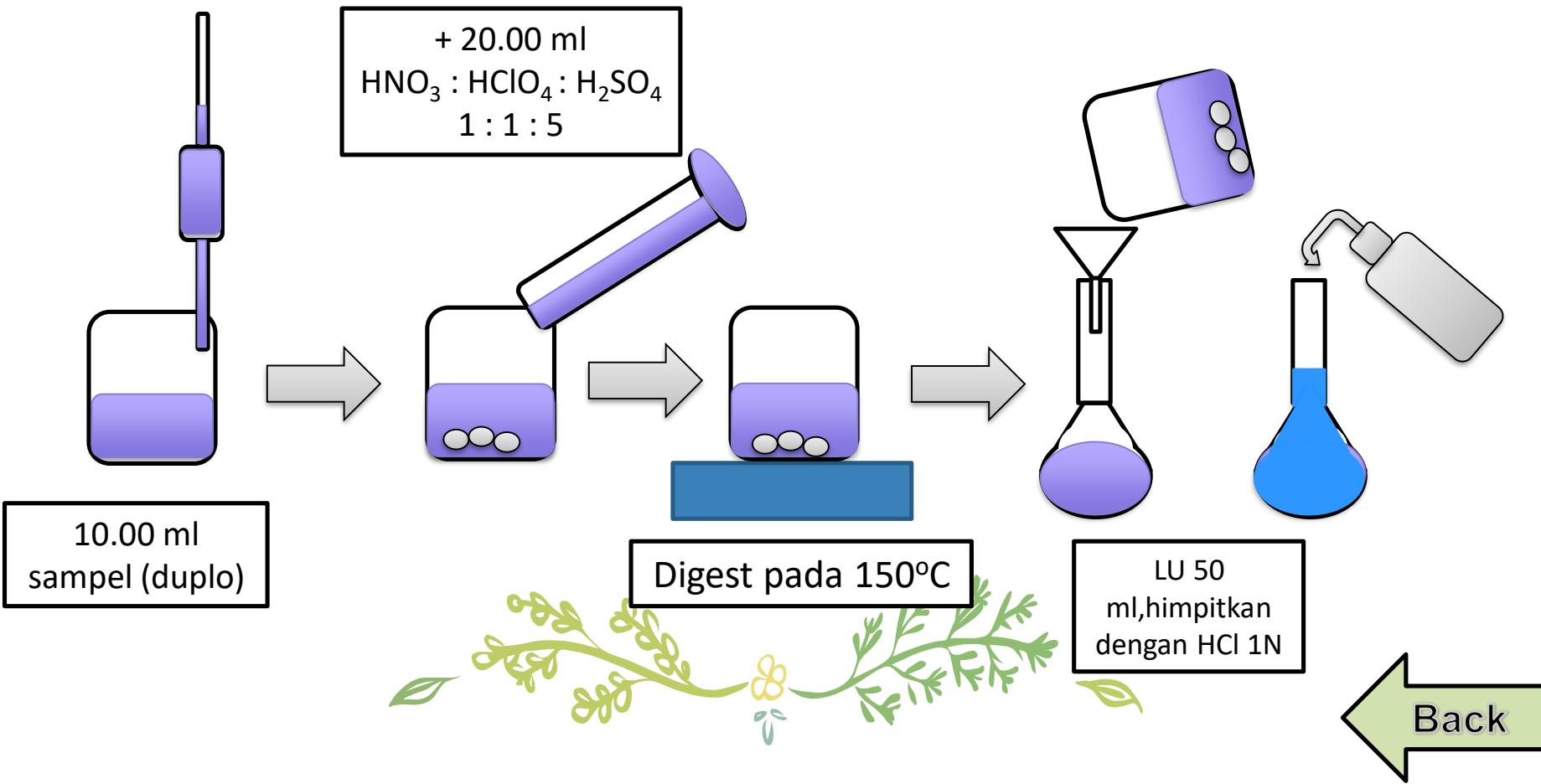


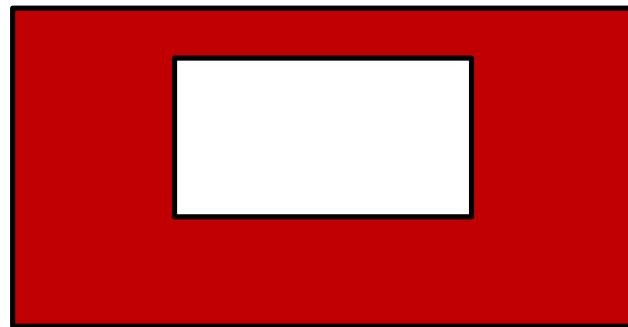
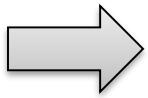
AAS hidrida



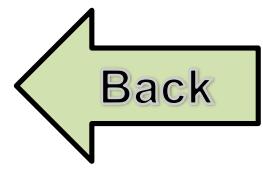
Bagan Logam Hg

Preparasi Sampel



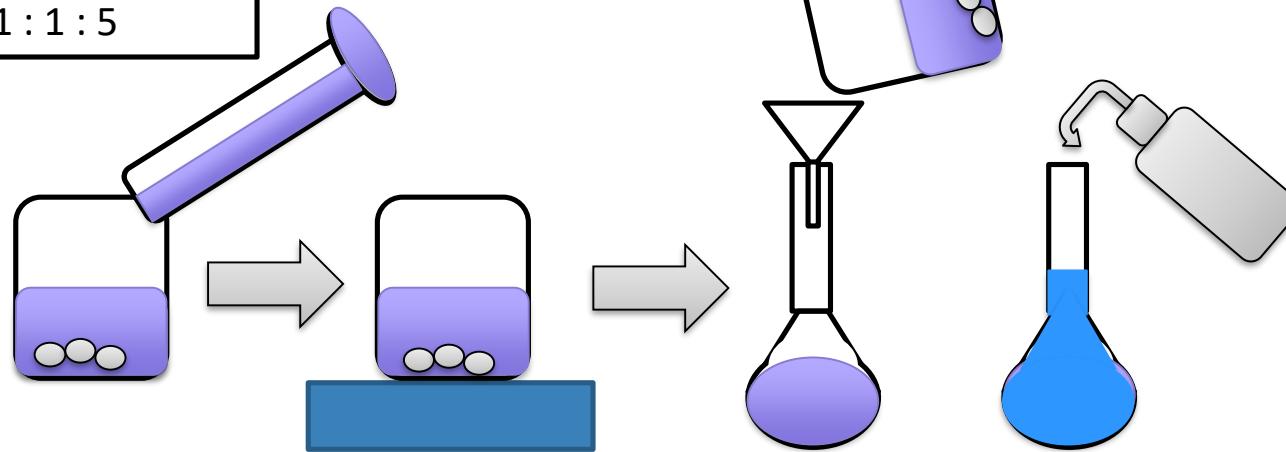


AAS Hidrida



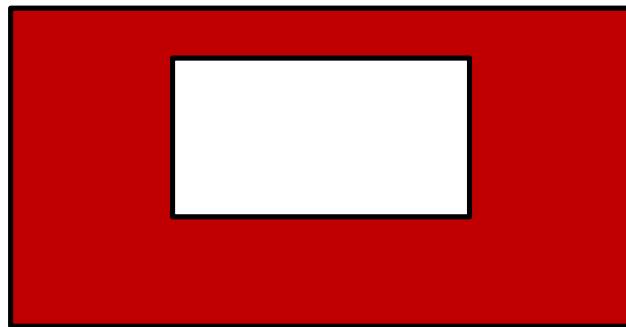
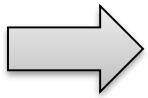
Blanko Koreksi

+ 20.00 ml
 $\text{HNO}_3 : \text{HClO}_4 : \text{H}_2\text{SO}_4$
1 : 1 : 5

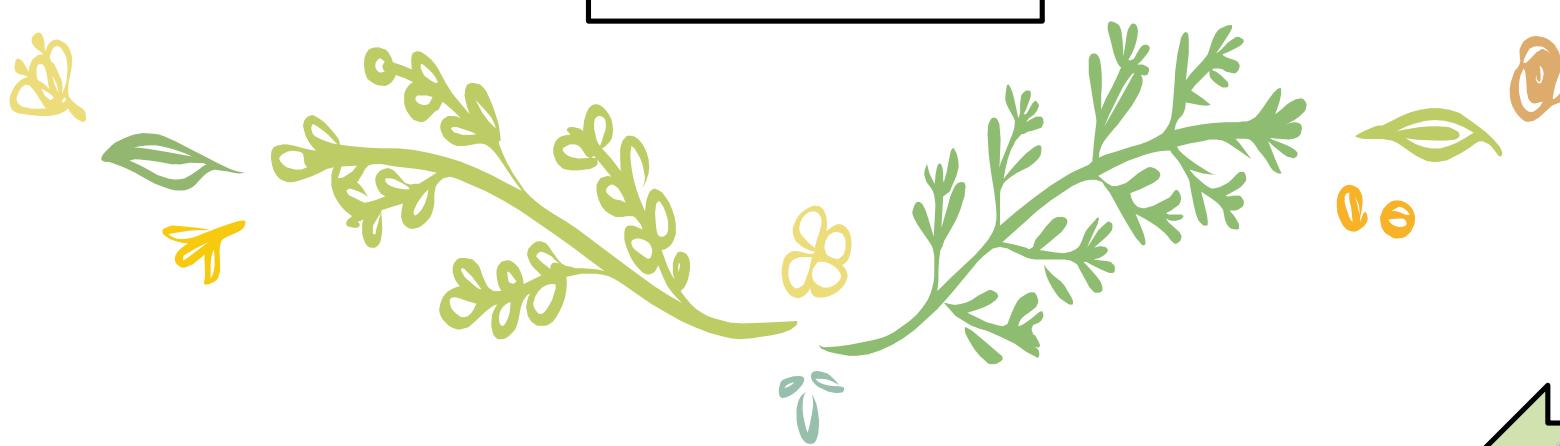


LU 50 ml,
himpitkan
dg HCl 1N

Back



AAS Hidrida



C organik

pH

As

Hg

N

Analisis kewirausahaan

P

K

Coliform,
Salmonella &
E.Coli

Fe, Cu,
Pb, Cd,
Mn, Co,
Zn



pH

Nama Bahan	Harga
Buffer pH 4	Rp.4040
Buffer pH 7	Rp.3920
Total	Rp.7960

C – Organik

Nama Bahan	Harga
K ₂ CrO ₇	Rp.39330
H ₂ SO ₄ (p)	Rp.19800
FeSO ₄	Rp.3544
KMnO ₄	Rp.2155
Total	Rp.64829



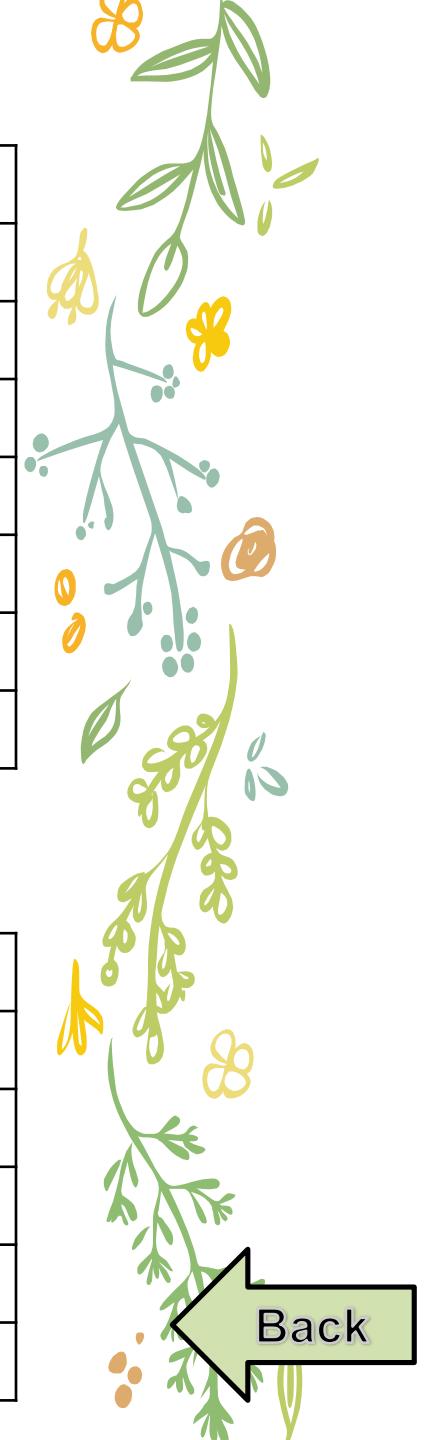
Back

Nitrogen

Nama Bahan	Harga
Camp. Selen	Rp.7090
H_2SO_4 (p)	Rp.13200
NaOH	Rp.16360
H_3BO_3	Rp.17670
Ind. BCG	Rp.15560
Ind. MM	Rp.1730
Total	Rp.71610

P_2O_5

Nama Bahan	Harga
HNO_3	Rp.21390
HClO_4	Rp.92310
Amm. Molibdat	Rp.34560
Amm. Vanadat	Rp.16900
Total	Rp.165160



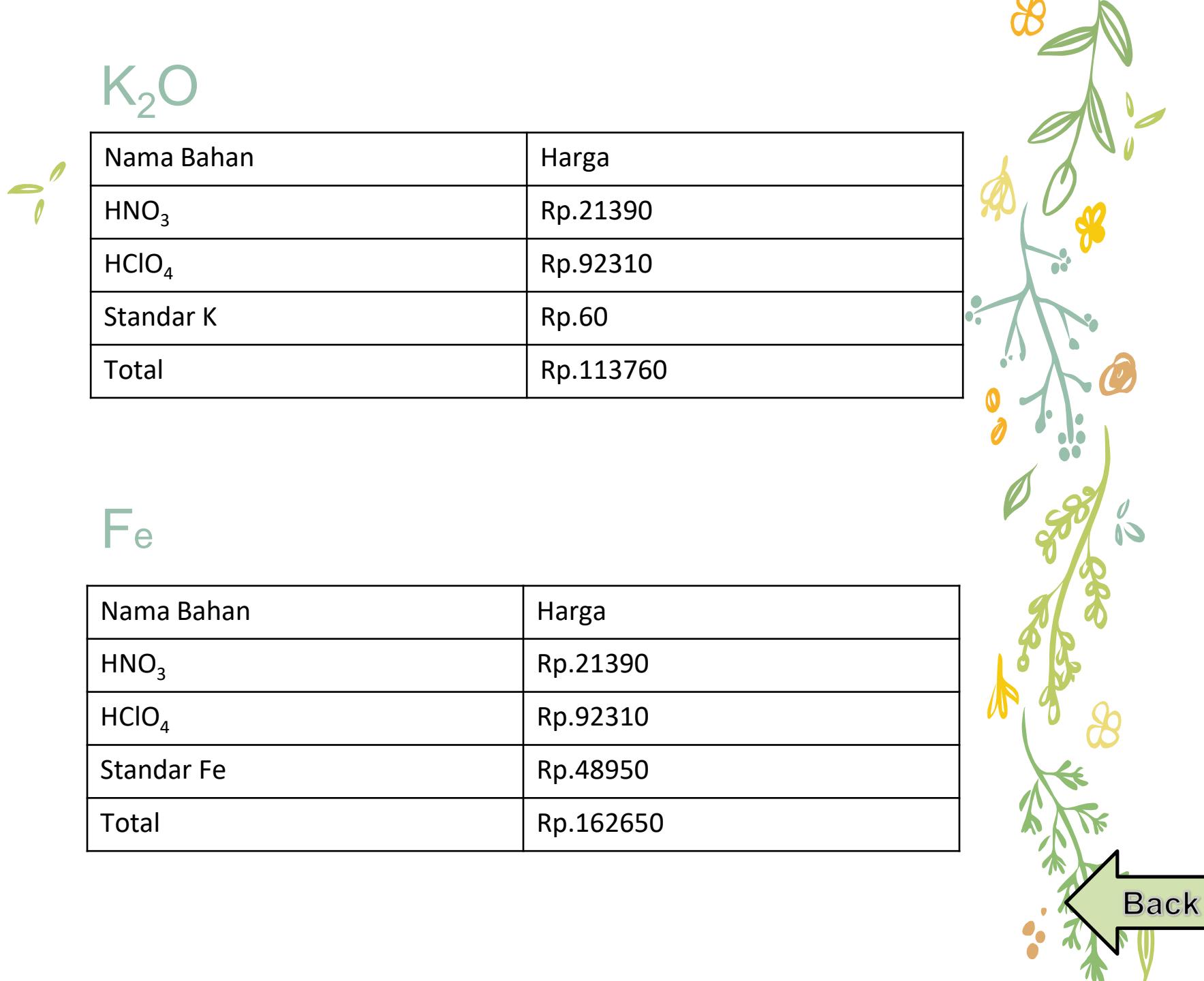
Back

K₂O

Nama Bahan	Harga
HNO ₃	Rp.21390
HClO ₄	Rp.92310
Standar K	Rp.60
Total	Rp.113760

Fe

Nama Bahan	Harga
HNO ₃	Rp.21390
HClO ₄	Rp.92310
Standar Fe	Rp.48950
Total	Rp.162650

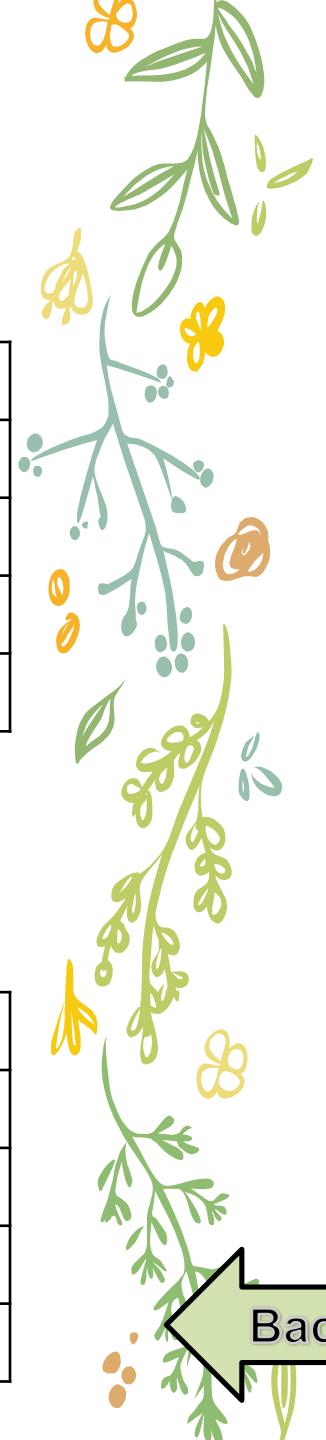


Back



Cu

Nama Bahan	Harga
HNO ₃	Rp.21390
HClO ₄	Rp.92310
Standar Cu	Rp.48950
Total	Rp.162650



Mn

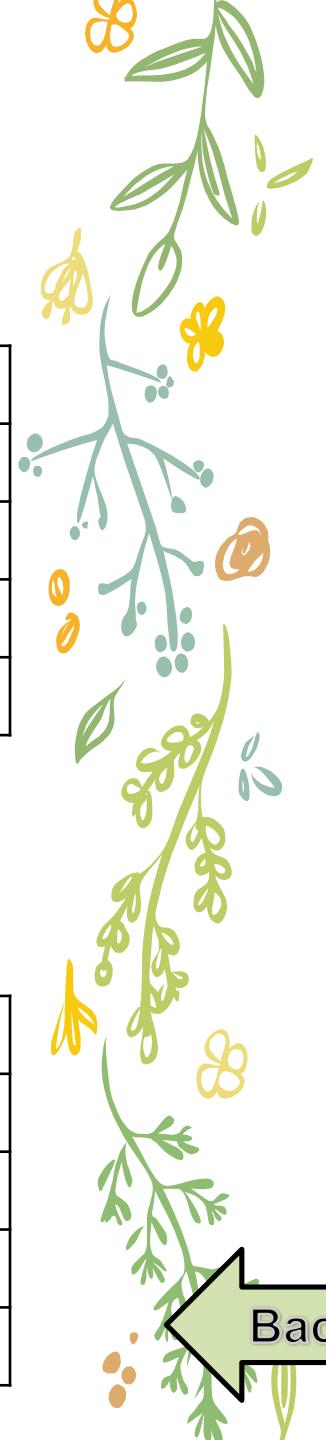
Nama Bahan	Harga
HNO ₃	Rp.21390
HClO ₄	Rp.92310
Standar Mn	Rp.49900
Total	Rp.163600





Co

Nama Bahan	Harga
HNO_3	Rp.21390
HClO_4	Rp.92310
Standar Co	Rp.44000
Total	Rp.157700



Zn

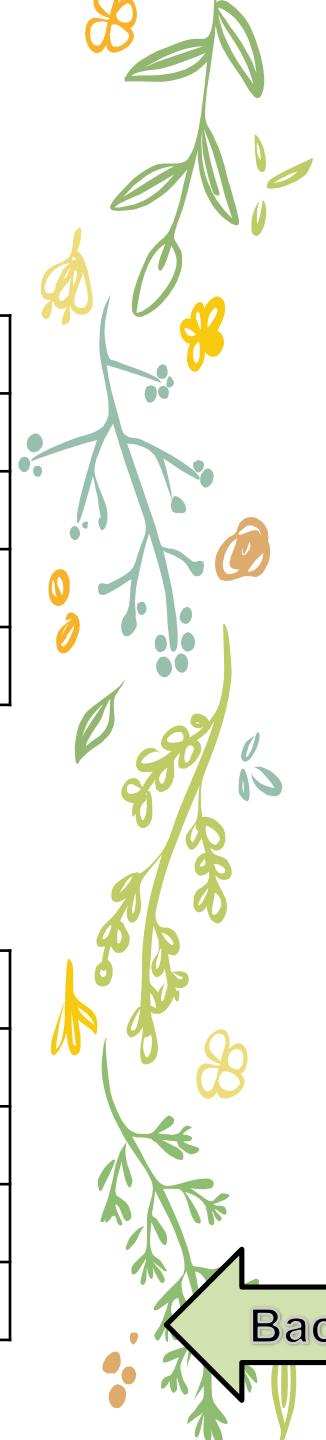
Nama Bahan	Harga
HNO_3	Rp.21390
HClO_4	Rp.92310
Standar Zn	Rp.48950
Total	Rp.162650





Cd

Nama Bahan	Harga
HNO ₃	Rp.21390
HClO ₄	Rp.92310
Standar Cd	Rp.52450
Total	Rp.166150



Pb

Nama Bahan	Harga
HNO ₃	Rp.21390
HClO ₄	Rp.92310
Standar Pb	Rp.50000
Total	Rp.163700





As

Nama Bahan	Harga
HNO_3	Rp.21390
HClO_4	Rp.92310
Standar As	Rp.43400
Total	Rp.157100



Hg

Nama Bahan	Harga
HNO_3	Rp.7130
HClO_4	Rp.30770
H_2SO_4	Rp.13200
Standar Hg	Rp.107800
Total	Rp.158900



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Total coliform

Nama Bahan	Harga
BGBB	Rp.13900
BPW	Rp.38800
Total	Rp.52700

Uji *E. Coli*

Nama Bahan	Harga
MCA	Rp.14370
Total	Rp.14370

Uji *Salmonella*

Nama Bahan	Harga
BGA	Rp.25700
LIA	Rp.25700
Total	Rp.51400



 Back

C organik

Coliform

As

Hg

N

data

P

K

Fe, Cu,
Pb, Cd,
Co, Zn

Nitrogen



	simplo	duplo
W sampel	1.9854 gr	1.9620 gr

Data Titrasi	
Vb	0.542 ml
Vs	0.587 ml



C organik



pengulangan	Bobot	vp	Np
Simplo	516.4 mg	1.2 ml	
Duplo	478.9 mg	1.3 ml	0.1023 N
blanko	-	1 ml	

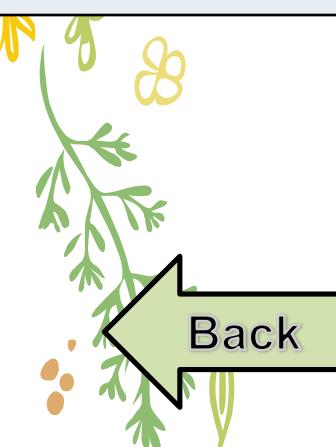


fosfor

No	Nama	Konsentrasi (ppm)	Abs
1	Std 0	0	0
2	Std 1	10	0.157
3	Std 2	20	0.337
4	Std 3	30	0.495
5	Std 4	40	0.543
6	Std 5	50	0.729
7	Blanko koreksi		-
8	Simplo		0.053
9	duplo		0.057

Slope	0.0159
Intersep	4.9524×10^{-3}
Regresi	0.9990
SD	3.78×10^{-4}

No	Abs LD
1	0.036
2	0.037
3	0.036
4	0.036
5	0.036
6	0.036



kalium

No	Nama	Konsentrasi (ppm)	%E
1	Std 0	0	0
2	Std 1	5	32.0
3	Std 2	10	48.4
4	Std 3	15	62.2
5	Std 4	20	73.2
6	Std 5	25	85.36
7	Blanko koreksi		12.3
8	Simplo		21.7
9	duplo		14.9

Slope	2.666
Intersep	20.45
Regresi	0.9949



Back

coliform



pengenceran	Tabung 1	Tabung 2	Tabung 3
10-1	+	+	-
10-2	-	-	-
10-3	-	-	-

timbal

No	Nama	Konsentrasi(ppm)	Abs
1	Std 0	0	0
2	Std 1	1	0.0117
3	Std 2	3	0.0330
4	Std 3	6	0.0642
5	Std 4	9	0.0938
6	Std 5	12	0.1228
7	Blanko koreksi		0.0140
8	Simplo		0.0007
9	duplo		0.0040

Slope	0.0102
Intersep	1.4824×10^{-3}
Regresi	0.9997
SD	1.8578×10^{-4}

No	Abs LD
1	0.0013
2	0.0013
3	0.0013
4	0.0013
5	0.0013
6	0.0013
7	0.0010
8	0.0010
9	0.0009
10	0.0009

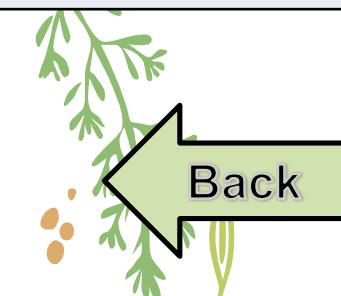


kadmium

No	Nama	Konsentrasi (ppm)	Abs
1	Std 0	0	0
2	Std 1	0.1	0.0147
3	Std 2	0.2	0.0291
4	Std 3	0.4	0.0560
5	Std 4	0.8	0.1065
6	Std 5	1.6	0.2015
7	Blanko koreksi		0
8	Simplo		0.0003
9	duplo		0.0002

Slope	0.1253
Intersep	3.2257×10^{-3}
Regresi	0.0994
SD	5.2705×10^{-5}

No	Abs LD
1	0.0017
2	0.0017
3	0.0017
4	0.0018
5	0.0017
6	0.0018
7	0.0018
8	0.0018
9	0.0018
10	0.0017

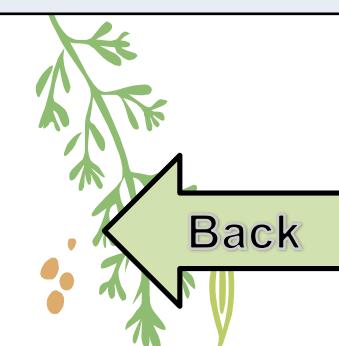
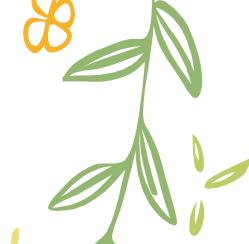


arsen

No	Nama	Konsentrasi (ppb)	Abs
1	Std 0	0	
2	Std 1	10	
3	Std 2	25	
4	Std 3	50	
5	Std 4	75	
6	Std 5	100	
7	Blanko koreksi		-0.0003
8	Simplo		0.0007
9	duplo		0.0015

No	Abs LD
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Slope	1.1834×10^{-3}
Intersep	1.7371×10^{-3}
Regresi	0.9956
SD	6.9061×10^{-4}



merkuri



No	Nama	Konsentrasi (ppb)	Abs
1	Std 0	0	
2	Std 1	10	
3	Std 2	25	
4	Std 3	50	
5	Std 4	75	
6	Std 5	100	
7	Blanko koreksi		0.0039
8	Simplo		0.0022
9	duplo		-0.0013

No	Abs LD
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Slope	$1,2473 \times 10^{-2}$
Intersep	-6.65×10^{-3}
Regresi	0.9899
SD	$5..6411 \times 10^{-4}$



besi



No	Nama	Konsentrasi (ppm)	Abs
1	Std 0	0	0
2	Std 1	1	0.0491
3	Std 2	2	0.0924
4	Std 3	3	0.1351
5	Std 4	4	0.1722
6	Std 5	5	0.2140
7	Std 6	8	0.3166
8	Blanko koreksi		0.0155
9	Simplo		0.0550
10	duplo		0.0218

No	Abs LD
1	0.0040
2	0.0037
3	0.0037
4	0.0038
5	0.0038
6	0.0038
7	0.0035
8	0.0037
9	0.0036
10	0.0037

Slope	0.03944
Intersep	0.01033
Regresi	0.9978
SD	1.3375×10^{-4}



tembaga

No	Nama	Konsentrasi(ppm)	Abs
1	Std 0	0	
2	Std 1	0.5	
3	Std 2	1	
4	Std 3	2	
5	Std 4	3	
6	Std 5	4	
7	Blanko koreksi		0.0009
8	Simplo		01295
9	duplo		0.0010

Slope	0.0280
Intersep	3.41×10^{-4}
Regresi	0.9998
SD	8.4327×10^{-5}

No	Abs LD
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

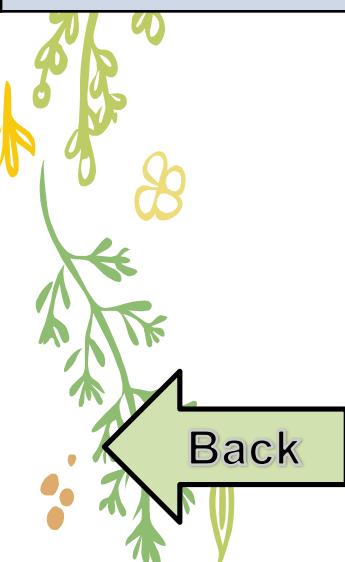


kobalt

No	Nama	Konsentrasi (ppm)	Abs
1	Std 0	0	0
2	Std 1	2	0.03108
3	Std 2	4	0.06698
4	Std 3	6	0.0909
5	Std 4	8	0.1216
6	Std 5	10	0.1515
7	Blanko koreksi		-0.0025
8	Simplo		-0.0004
9	duplo		-0.0005

Slope	0.0150
Intersep	1.8×10^{-3}
Regresi	0.9980
SD	7.15×10^{-4}

No	Abs LD
1	0.00299
2	0.00342
3	0.00498
4	0.00468
5	0.00451
6	0.00432
7	0.00442



seng

No	Nama	Konsentrasi (ppm)	Abs
1	Std 0	0	
2	Std 1	0.1	
3	Std 2	0.2	
4	Std 3	0.4	
5	Std 4	0.8	
6	Std 5	1.6	
7	Blanko koreksi		0.0156
8	Simplo		0.1589
9	duplo		0.1496

Slope	0.2374
Intersep	6.09×10^{-3}
Regresi	0.9984
SD	1.87×10^{-4}

No	Abs LD
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

