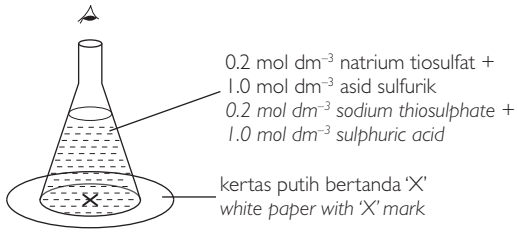
EKSPERIMEN KENDIRI

7 FAKTOR MEMPENGARUHI KADAR TINDAK BALAS

Buku Teks: BAB 1 m.s. 22 – 25

KBAT Menganalisis

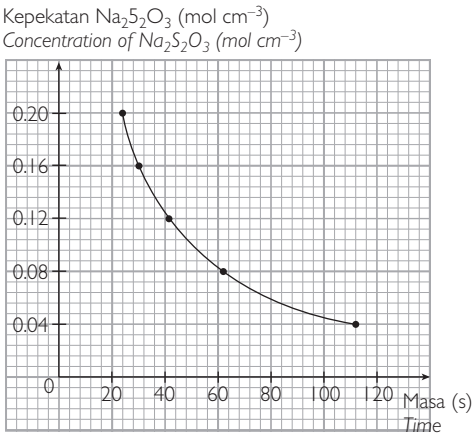
Tujuan *Aim*	Untuk menyiasat kesan kepekatan mempengaruhi kadar tindak balas antara natrium tiosulfat dengan asid sulfurik *To investigate the effect of the effect of concentration on the rate of reaction between sodium thiosulphate and dilute sulphuric acid*
Penyataan Masalah *Problem Statement*	Bagaimanakah kepekatan mempengaruhi kadar tindak balas antara natrium tiosulfat dengan asid sulfurik? *How does the concentration affect the rate of reaction between sodium thiosulphate and dilute sulphuric acid?*
Hipotesis *Hypothesis*	Semakin tinggi kepekatan larutan natrium tiosulfat, semakin tinggi kadar tindak balas dengan asid. *The higher the concentration of sodium thiosulphate solution, the higher the rate of reaction with acid.*
Pemboleh ubah *Variable*	(a) Dimanipulasi : Kepekatan larutan natrium tiosulfat *Manipulated : Concentration of sodium thiosulphate solution* (b) Bergerak balas : Kadar tindak balas *Responding : Rate of reaction* (c) Ditetapkan : Kepekatan dan isi padu asid sulfurik, suhu larutan *Fixed : Concentration and volume of sulphuric acid, temperature of the solution*
Bahan dan radas *Materials and apparatus*	0.2 mol dm^{-3} natrium tiosulfat, 1.0 mol dm^3 sulfurik asid, air suling 10 cm^3 100 cm^3 silinder penyukat, 100 cm^3 kelalang kon, kertas putih bertanda "X" dan jam randik *0.2 mol dm^{-3} sodium thiosulphate, 1.0 mol dm^3 sulphuric acid, 10 cm^3 distilled water, 100 cm^3 measuring cylinder, 100 cm^3 conical flask, white paper with "X" mark and stopwatch*
Prosedur *Procedure*	 **1** Sukat 50 cm^3 larutan natrium tiosulfat 0.2 mol dm^{-3} dengan menggunakan 100 cm^3 silinder penyukat dan dituang ke dalam kelalang kon kering. *Measured 50 cm^3 of 0.2 mol dm^{-3} sodium thiosulphate solution using a 100 cm^3 measuring cylinder and is poured into a dry conical flask.* **2** Letak kelalang kon di atas sehelai kertas yang mempunyai tanda 'X'. *Placed the conical flask is on top of a piece of paper with a 'X' mark.* **3** Sukat 5 cm^3 asid sulfurik 1 mol dm^{-3} dengan menggunakan 10 cm^3 silinder penyukat dan tuang ke dalam larutan natrium tiosulfat dengan cepat. Jam randik dimulakan dengan serta-merta. *Measured 5 cm^3 of 1 mol dm^{-3} sulphuric acid is using a 10 cm^3 measuring cylinder. The acid is then quickly poured into sodium thiosulphate solution. The stop watch is started immediately.* **4** Goncang campuran bahan tindak balas dalam kelalang kon dan tanda 'X' dilihat tegak dari atas kelalang kon. *Swirled the reaction mixture in the conical flask and the 'X' mark is viewed vertically from the top of conical flask.* **5** Jam randik dihentikan sebaik saja tanda 'X' hilang daripada pandangan. Rekodkan masa yang diambil. *The stop watch is stopped immediately when the mark 'X' is no longer visible. Recorded the time taken.* **6** Ulang langkah 1 – 5 dengan menggunakan campuran isi padu larutan natrium tiosulfat dan isi padu air suling yang berbeza seperti ditunjukkan dalam jadual. *Steps 1 to 5 are repeated using different mixture volume of sodium thiosulphate solution with different volumes distilled water as shown in the table.*

Eksperimen

Pemerhatian /Perbincangan
Observations /Discussion

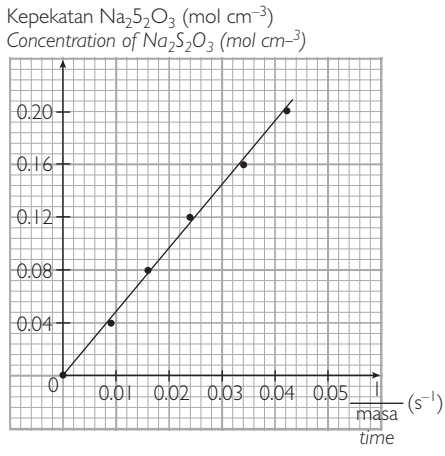
Eksperimen *Experiment*	1	2	3	4	5
Isi padu larutan natrium tiosulfat 0.2 mol dm^{-3} *Volume of 0.2 mol dm^{-3} sodium thiosulphate solution, cm^3*	50.0	40.0	30.0	20.0	10.0
Isi padu air suling *Volume of distilled water, cm^3*	10.0	20.0	30.0	40.0	50.0
Isi padu larutan asid sulfurik 0.2 mol dm^{-3} *Volume of 1.0 mol dm^{-3} sulphuric acid, cm^3*	5.0	5.0	5.0	5.0	5.0
Kepekatan larutan natrium tiosulfat *Concentration of sodium thiosulphate, mol dm^{-3}*	0.20	0.16	0.12	0.08	0.04
Masa yang diambil, *Time taken, s*	25.0	31.0	42.0	63.0	112.0
1/ masa *1/ time, s^{-1}*	0.040	0.032	0.024	0.016	0.009

Graf kepekatan larutan natrium tiosulfat lawan masa
Graph concentration of sodium thiosulphate solution



Graf 1
Graph 1

Graf kepekatan larutan natrium tiosulfat lawan 1/masa
Graph concentration of sodium thiosulphate solution against 1/time



Graf 2
Graph 2

Inferens
Inferences

1 Berdasar Graf 1, semakin tinggi kepekatan larutan natrium tiosulfat, semakin pendek masa yang diambil untuk tanda 'X' hilang daripada pandangan.

Based Graph 1, the higher the concentration of sodium thiosulphate solution, the shorter the time taken for 'X" mark to disappear from view.

2 Berdasar Graf 2, semakin tinggi kepekatan larutan natrium tiosulfat, semakin besar nilai 1/masa. 1/masa mewakili kadar tindak balas. Jesteru, kadar tindak balas meningkat apabila kepekatan larutan natrium tiosulfat meningkat. KBAT Menganalisis

Based Graph 2, the higher the concentration of sodium thiosulphate solution, the larger the value of 1/time. 1/time represent the rate of reaction. Hence, the rate of reaction increases when the concentration of sodium thiosulphate solution increases.

Kesimpulan
Conclusion

Apabila kepekatan satu bahan tindak balas meningkat, kadar tindak balas juga meningkat. Maka hipotesis diterima.

When the total surface area of a reactant increases, the rate of reaction increases. There for the hypothesis is accepted.

EKSPERIMEN KENDIRI

8 GETAH ASLI

Buku Teks: BAB 2 m.s. 176 – 178

KBAT Menganalisis

Tujuan *Aim*	Untuk mengkaji kesan asid dan alkali terhadap gumpalan lateks *To investigate the effects of acid and alkali on coagulation of latex*
Penyataan Masalah *Problem Statement*	Bagaimanakah jenis larutan yang ditambah kepada lateks mempengaruhi penggumpalannya? *How does the solution added to latex affect its coagulation?*
Hipotesis *Hypothesis*	Apabila asid etanoik ditambah ke dalm lateks, lateks menggumpal manakala apabila larutan ammonia ditambah ke dalam lateks, lateks tidak menggumpal. *When ethanoic acid is added into latex, the latex coagulate whereas when ammonia solution is added into latex, the latex does not coagulate.*
Pemboleh ubah *Variable*	(a) Dimanipulasi : Asid etanoik dan larutan ammonia *Manipulated : Ethanoic acid and ammonia solution* (b) Bergerak balas : Penggumpalan lateks *Responding : The coagulation of latex* (c) Ditetapkan : Isi padu lateks, isi padu dan kepekatan asid etanoik dan larutan ammonia *Fixed : Volume of latex, volume and concentration of ethanoic acid and ammonia solution*
Bahan dan radas *Materials and apparatus*	Asid etanoik 1 mol dm^{-3}, larutan ammonia 1 mol dm^{-3}, lateks ,bikar 100 cm^3, rod kaca, penitik, 100 cm^3 silinder penyukat *Ethanoic acid 1 mol dm^{-3}, ammonia solution 1 mol dm^{-3} , latex, 100 cm^3 beaker, glass rod, dropper, 100 cm^3 measuring cylinder*
Prosedur *Procedure*	**1** 20 cm^3 lateks disukat dengan menggunakan silinder penyukat dan dituang ke dalam dua bikar. Bikar masing-masing dilabelkan sebagai A dan B. *20 cm^3 of latex is measure using measuring cylinder and poured into two beakers. These beakers are labelled as A and B respectively.* **2** Lateks dalam bikar A ditambah setitik demi setitik 5 cm^3 asid etanoik dan campuran dikacau dengan rod kaca, *Latex in beaker A is added drop-by-drop with 5 cm^3 of ethanoic acid and the mixture are stirred thoroughly with glass rod.* **3** Langkah 1-2 diulang dengan menggantikan asid etanoik dengan larutan ammonia dalam bikar B. *Steps 1-2 are repeated by replacing ethanoic acid with ammonia solution in beaker B.* **4** Campuran dalam bikar A dan B dibiarkan selama 3 jam. *The mixture in beakers A and B is left for 3 hours.* **5** Perubahan pada lateks diperhatikan dan direkodkan. *The changes in latex is observed and recorded.*

Eksperimen

<table>
<tr><td>Pemerhatian /Inferens
Observations /Inference</td><td>
<table>
<tr><th>Bikar
Beaker</th><th>Pemerhatian dalam air bromin
Observation with bromine water</th><th>Inferens
Inference</th></tr>
<tr><td>A
(Lateks + asid etanoik)
(Latex + ethanoic acid)</td><td>Lateks menggumpal
Latex coagulates</td><td>Lateks menggumpal dalam kehadiran asid etanoik.
Latex coagulates in the presence ethanoic acid.</td></tr>
<tr><td>B
(Lateks + larutan ammonia)
(Latex + ammonia solution)</td><td>Lateks tidak menggumpal
Latex remains in liquid state</td><td>Lateks tidak menggumpal dalam kehadiran larutan ammonia.
Latex does not coagulate in the presence ammonia solution</td></tr>
</table>
</td></tr>
<tr><td>Kesimpulan
Conclusion</td><td>Asid menggumpalkan lateks manakala alkali mencegah lateks daripada menggumpal.
Acid coagulates latex whereas alkali prevents latex from coagulating.</td></tr>
</table>