

Lab. 343



FLINN
SCIENTIFIC, INC

Experiment (4)

Determination of the rate constant and order of the sulphite – iodate reaction

Induction or incubation period

The time elapsed from the start of reaction until the second step of reaction occurs.



$$\underline{\text{Rate} = R = K C^n}$$

where K = rate constant
 C = Concentration of sulphite (mole/l)
 n = order of reaction with respect to sulphite

$$\underline{R = C/t}$$

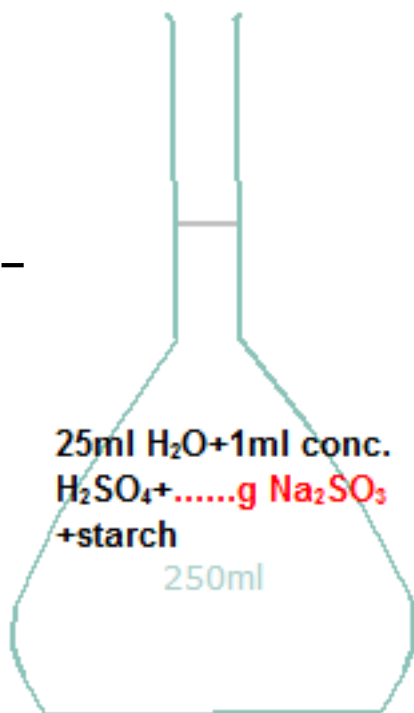
where C = Concentration of sulphite (mole/l)
 t = the induction period

$$\log R = \log K + n \log C$$

Prepare:

1. Na_2SO_3 (0.01M) \longrightarrow 250ml
2. Weight 2 gm starch are dissolved in 10 ml H_2O , and added drop by drop to about 100ml boiling water.

3-

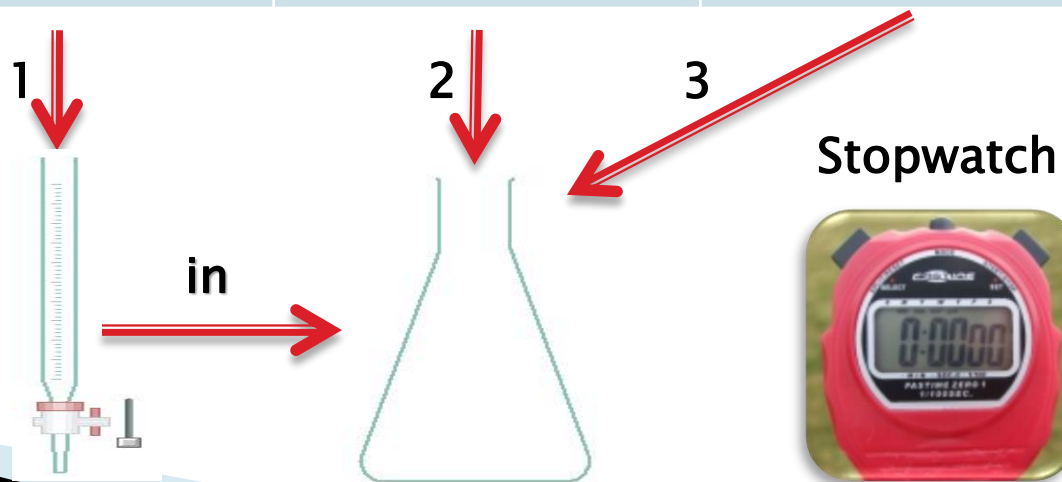


4- KIO_3 (0.0211M) \longrightarrow 100ml

Procedure:

Series (I)

Sulphite (ml)	Dist. H2O (ml)	Iodate (ml)
30	65	5
25	70	5
20	75	5
15	80	5
10	85	5



To calculate the dilute concentration of Na_2SO_3

$$N \times V (\text{conc.}) = N \times V (\text{dil.})$$

Ex. $30 \times 0.01 = N \times 100$

$$N \text{ dil.} = 3 \times 10^{-3} \text{ M}$$

C	t	R=C/t	logC	logR
3×10^{-3}			-ve	-ve
2.5×10^{-3}			values	values
2×10^{-3}				
1.5×10^{-3}				
1×10^{-3}				

Series (II)

Sulphite (ml)	Dist. H2O (ml)	Iodate (ml)
30	63	7
25	68	7
20	73	7
15	78	7
10	83	7

C	t	$R=C/t$	$\log C$	$\log R$
3×10^{-3}			-ve	-ve
2.5×10^{-3}			values	values
2×10^{-3}				
1.5×10^{-3}				
1×10^{-3}				