SAPONIFICATION REACTION OF ETHYL ACETATE WITH SODIUM HYDROXIDE

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AIM

- Monitor the kinetics of a reaction by looking at the concentration of one of its reactants.

- Check that the reaction is a first order reaction with respect to both reactants.

- Obtain the speed constant at the reaction temperature.

THEORETICAL BACKGROUND

$$CH_3COOCH_2CH_3 + NaOH \rightarrow CH_3CH_2OH + CH_3COONa$$

1.	b	a	0	0	**a>b**
2.	b-X	a-X	X	X	

1 is the initial situation, and once time is passed (t), we finish in the second one, in which a quantity of X mol/L of each reagent will have been consumed.

THEORETICAL BACKGROUND

$$\frac{dx}{dt} = k[NaOH]^{\alpha}[EtAz]^{\beta} = k(a-x)^{\alpha}(b-x)^{\beta}$$

Equation 1: Kinetic equation

$$k \cdot t = \frac{1}{(a-b)} \ln \frac{b(a-x)}{a(b-x)}$$

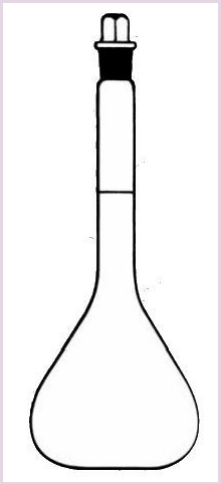
Equation 2

$$\ln\left(\frac{V_0 - V_t}{V_\infty - V_t}\right) + \ln\frac{b}{a} = k(a-b)\cdot t$$

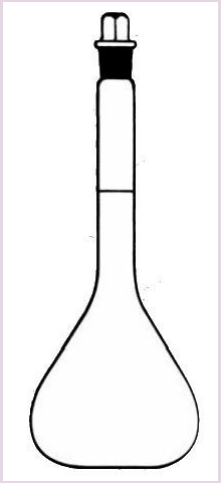
Equation 3

EXPERIMENTAL PROCEDURE

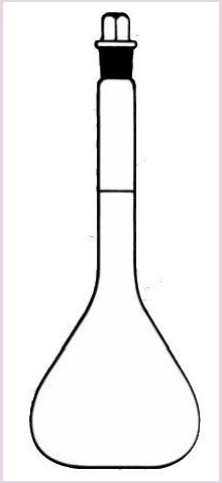
1. Initial dissolutions



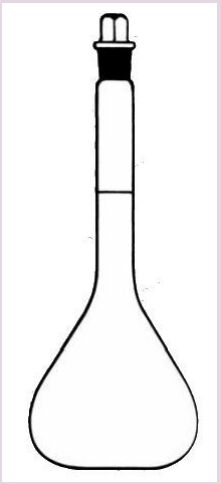
1L NaOH
0,025M



250 mL HCL
0,05M



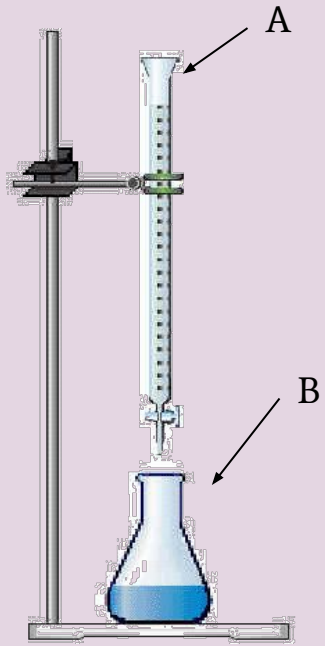
KHFt
0,025M



1L AcEt
(1,6 mL solute/1L dissolution)

EXPERIMENTAL PROCEDURE

2. Titration



TITRATION	1	2
A: Reagent solution	KHFt	NaOh
B: Analyte	NaOh	Hcl

EXPERIMENTAL PROCEDURE

3. Heat the dissolutions in an isothermal bath

ISOTHERMAL BATH

Until you reach 25ºC

15mins aprox.

100mL NaOh

100 mL AcEt

EXPERIMENTAL PROCEDURE

4. HCl

x6

10mL Hcl

EXPERIMENTAL PROCEDURE

5. Reaction NaOh and Acet

100mL AcEt

Quickly!

100mL NaOh

Leave it for 3 minutes

*Keep the reaction Tcte

EXPERIMENTAL PROCEDURE

6. Pour the reacting mixture with Hcl

100mL NaOh
+
100mL AcEt

25ml

10mL HCL

Repeat this operation after.

- 7min
- 13min
- 20min
- 30min
- 45min

(Remember to back-titrate the excess acid)

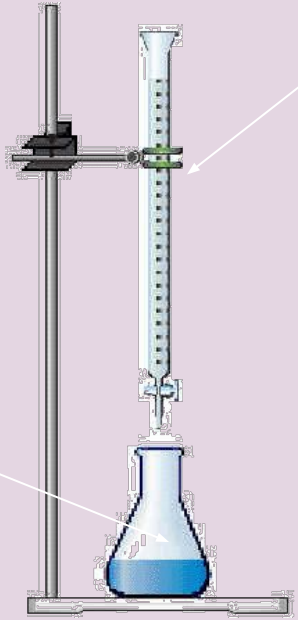
After the last extraction, cover the erlenmeyer and leave it to react at room T until the following day.

EXPERIMENTAL PROCEDURE

7. Titrate

Reacting mixture

25mL



NaOh

BIBLIOGRAPHY

https://egela.ehu.eus/pluginfile.php/2546939/mod_resource/content/1/9_SaponificationRxn.pdf