R35.6

Titration Curves of a Strong and a Weak Acid with a Strong Base.

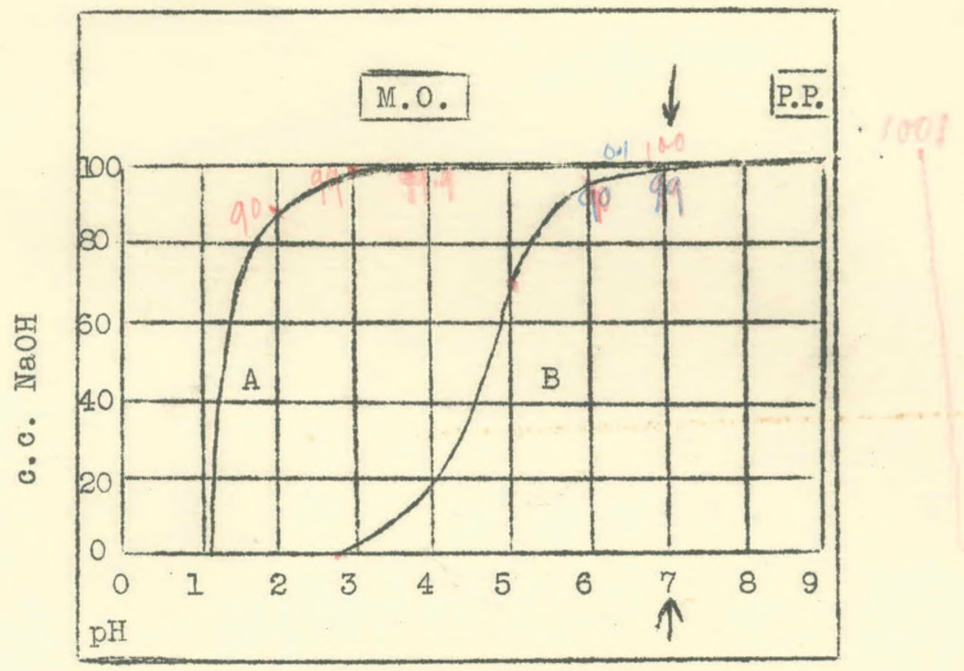

Fig. 1.

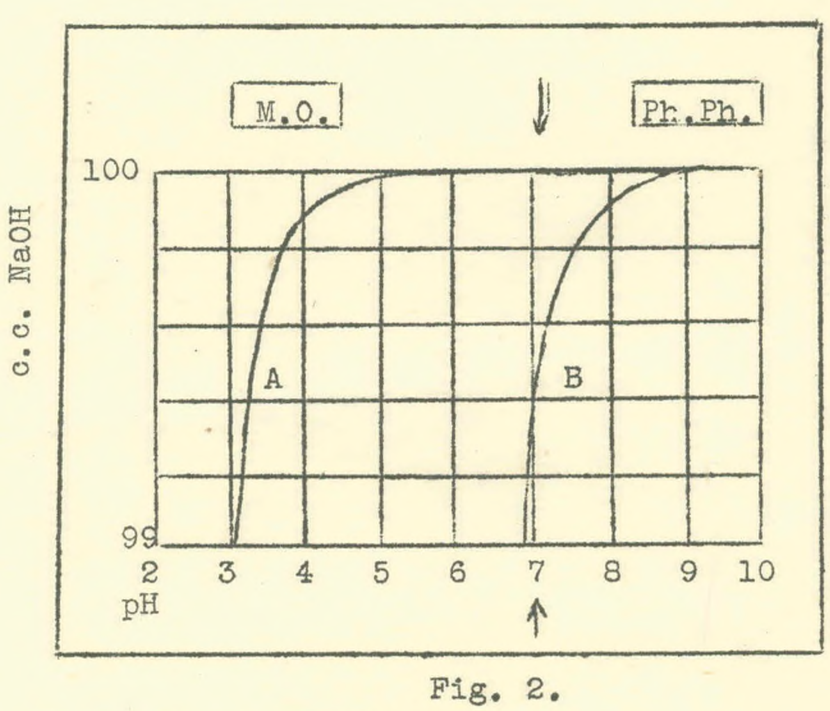

Fig. 2.

Curves A = 0.1N.HCl
" B = Acetic Acid
M.O. = Methyl Orange colour range
P.P. = Phenol Phthalein

23
35.5
58.5

1 litre of N. NaCl → 58.5 gm NaCl.

D.P.H

Practical V.

1. Determine the amount of chloride chlorine in:-
   (a) tap water, (b) sewage effluent A , (c) water B.

   Express your result as parts per 100,000 and also as grams per gallon in terms of chlorine and of sodium chloride.

   [Given 0.01N Silver Nitrate]

2. Test the waters C, D, E, and F for the presence of poisonous metals.

   Determine the amount present in water C.

(a) Tap water 100 cc + K_2CrO_4 + 8.6 cc $AgNO_3$ → Brick red
neutral to litmus
(b) sewage Eff. A 100 + K_2CrO_4 + 25.6 cc $AgNO_3$ .01N. neutral
(c) water B 100 — 8.8 c.c.

K_2CrO_4 dissolve in acid.

100 = 8.6.

100 cc H_2O req. 8.6 cc 0.01N $AgNO_3$

100 X = 8.6 X 10

1 cc H_2O X = 8.6 X 0.01

1 cc $AgNO_3$ = 0.01 mgm.

100 c.c. H_2O req. 8.6 cc 0.01N $AgNO_3$

100,000 mgm H_2O = .00086

1 litre N.Cl = 35

∴ litre of N = 35 X .005

∴ 1 litre NCl contains 35.5 gms Cl

∴ 1 litre 0.01 N Cl .. $\frac{35.5 \times .01}{}$ = .355

∴ 1 cc 0.01 N Cl = $\frac{.355}{1000}$ = .000355 gms

= .355 mgms.

100 000 mgms H_2O = 8.6 X .355 mgms = 3.0530 mgms Cl

∴ 100 000 mgms water contains 3.0530 parts Cl

Pb . Cu Fe Zn Test

C D E F

NH_4S Light Brown Light Brown Black White ppt

HCl. Colour remains Colour disappears

KCN Colour remains Colour remains

Fresh Solution F + HCl + H₂ ... D = [illegible] ppt

D + HCl + K ferro cyan F = Blue ppt

Practical VII.

1. Estimate in water (A) the ammoniacal nitrogen by

   (i) direct Nesslerisation
   (ii) the Wanklyn process

2. Test water (B) for the presence of free chlorine.

   Carry out the following two tests for free chlorine:

   (a) Add a few drops of potassium iodide solution and a drop or two of starch solution. Iodine is liberated if free chlorine is present and a blue colour is obtained with the starch. This test is not specific.

   (b) If a few drops of an O-tolidine solution in acetic acid are added to water containing free chlorine an intense yellow colour develops.

Ammonia free H_2O 50 match 2 cc S.S.
50 1 cc
50

Direct Nesslerisation 50 cc + Nesslerising reagent 2cc Stand S.S.
1 cc. contains 0.01 mgm. 10^5.
∴ 50 cc ,, 0.01 × 2
∴ 100 cc ,, $\frac{0.01 \times 2 \times 100}{50}$ = 0.04 mgm 10^5 H_2O

Wanklyn Distillation process
25 cc water + Nessler required 2 cc S.S.

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50 cc Distillate ≡ 8 cc S. Am Cl.
∴ 250 cc ,, ≡ 40 cc S. Am Cl. (1 cc S. Am Cl = 0.01 mgm NH_3)
≡ 0.40 mgm NH_3
∴ 500 cc Water ≡ 0.4 mgm NH_3
∴ 100 cc ,, ≡ 0.08 mgm NH_3

D.P.H

Practical VII.

1. Test the sample of water (A) for nitrite, 12cc Nessler
qualitatively and quantitatively.

2. Test the tap water for the presence of nitrate
and if present determine the amount.

3. Estimate the "nitric nitrogen" in the sample of
sewage works effluent (B).

20 cc. Sewage B match 50cc std. Soln.

$\frac{20}{50}$ Sample = 50cc Standard = 0.1 mgm N
(10cc S. KNO_3
1cc = 0.01)

$\frac{20}{50}$ x 10cc Water = 0.1 mgm N

10cc Water = $0.1 \times \frac{50}{20}$ mgm N

100 cc = $0.1 \times \frac{50}{20} \times \frac{100}{10}$
= $\frac{50}{2}$ = 2.5 mgm
= 2.5 gm pts/10^5

1000) 35.5-0 355

D. P. H.

Practical XV

1. Determine the protein content of the wheat flour provided. [Use about 0.5 gm. of the flour. Digest in a Kjeldahl flask with 20 cc. of concentrated H_2S_4.]

Starch until filtrate does not give iodine colour (blue)

2. Note the general character of the flour and satisfy yourself that it contains "gluten". This "gluten" is soluble in alkali and in acetic acid. Test such a solution for proteins by means of such tests as Millon's, the glyoxylic and the xanthoproteic. Perform these test also on (1) phenol, (2) benzoic acid, and (3) salicylic acid.

3. Examine the starches set out under the microscopes.

Suppose 6.5 ccs of ·1N NH_3 came from 0.5 gms flour

i.e. 0.5 gms flour contains $\frac{6.5 \times 1.4}{100}$

(5.68 is the factor for converting wheat nitrogen into protein) $= \frac{6.5 \times 1.4 \times 5.68}{1000}$ gms protein

∴ 100 gms flour contains $\frac{100}{0.5} \times \frac{6.5}{1000} \times 1.4 \times 5.68$

= 10.34 gms prot.

i.e. 10.34%

D.P.H.

Practical XXII.

(a) 10cc. suspension
5.2cc. sod arsenite
1.1 cc. I_2.

1. Identify the disinfectants A and B.

2. Estimate the strength of (a) the given sample of bleaching powder, (b) the solution of chlorine. Use two methods and compare your results.

10cc. cl.
3 cc sod arsen
+15cc Iod

3. Determine the strength of the phenol solution C. Express your results as a normality and as grams per cent.

16.6cc. 0.1N sod thiosulph

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