E-18

PEN-TAB

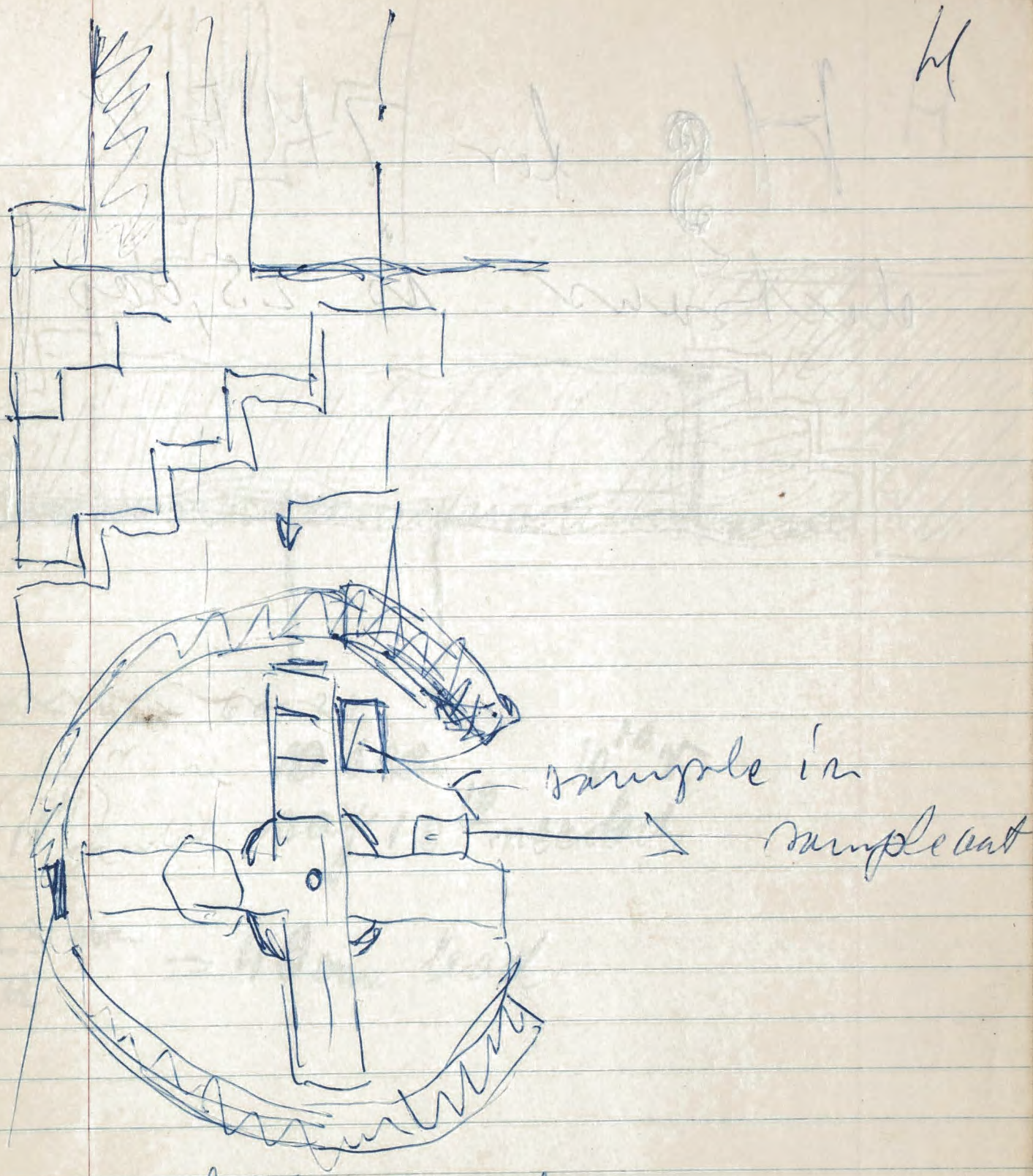
WIRE BOUND
COMPOSITION BOOK

NAME Leo Zila d

ADDRESS 1155 E 57th St

SUBJECT Chicago Ill

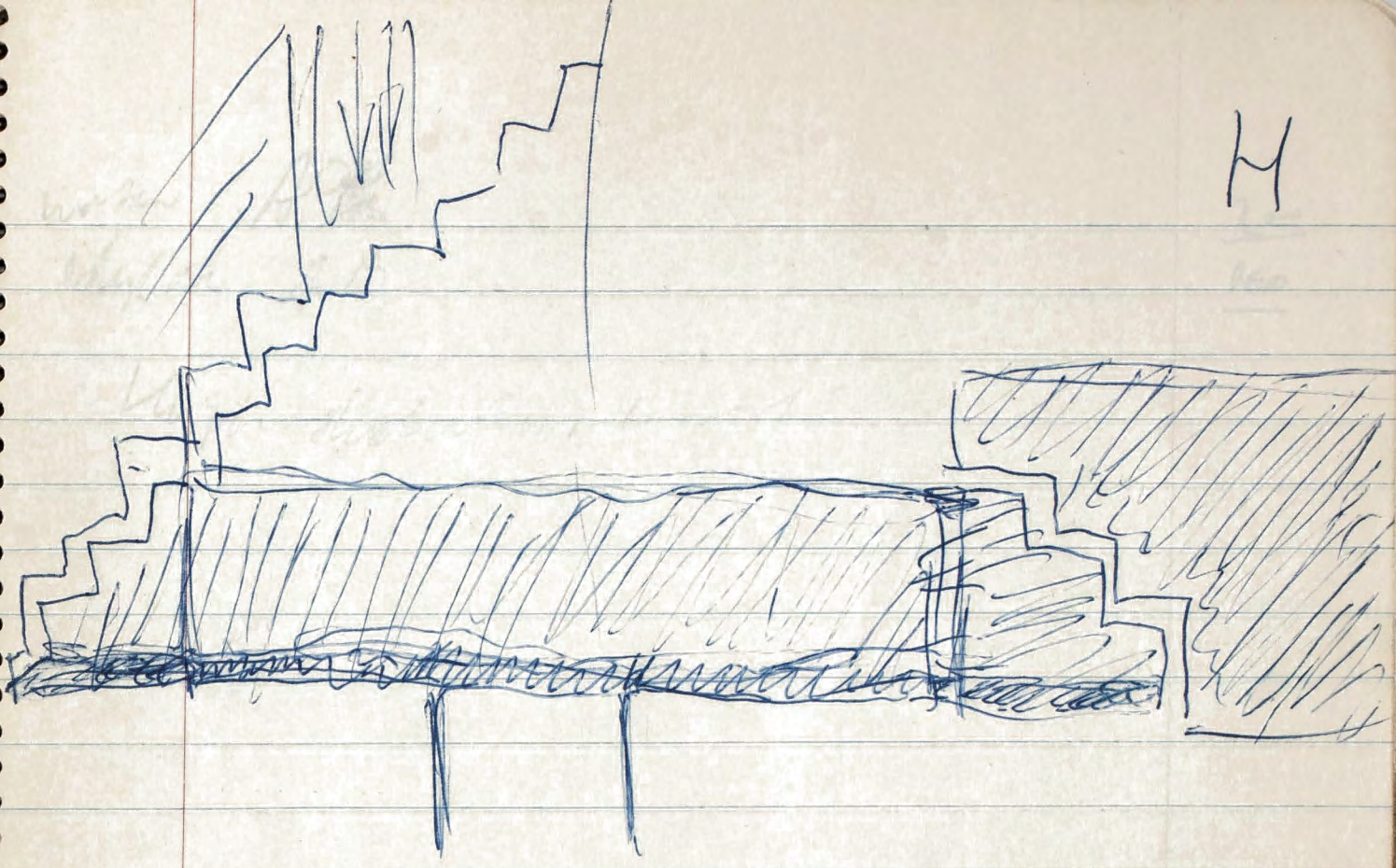
NO. K-201
MADE IN U.S.A.



magnet holds sample

Hg for 7MRV

decisions is 25,000



~~300mm max 60x24~~

10^{6} r in 10 sec 10^{10} r

10^{-11} needed say 10^{10} needed

23 ~~Gm~~ / TR = 40 mm lead

Solvents

alcohols

acetic acid

1-4 dioxane

Dimethyl formamide

ethylene glycols

substituted " (Cello solves)

---

smoke { Munch

Tour-phenol } Chastman (bist - products)

Tax Schedules

₦100 000

1.) borrow money to 80% of income

tax bracket must be

25% first 5 years [500]

next 5 years → 10

next 5 years

next 5 years

6 1/2 %

3 1/4 %

2 1/2 %

1 1/4 %

0.25 % → 15 years

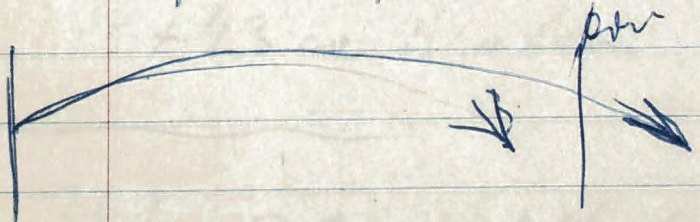
0.

Company A

loans to 80% max ₦100000 at 20%

he buys stock, sells it before dividend

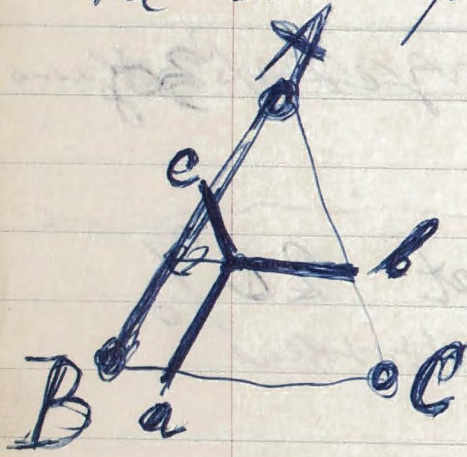
buys it after dividend



100 cc H2O dissolves 1.7 gm
propyl acetate at 20°C

p. 136 1 cc Acetone + 10 cc H2O
will take 1 cc Ethyl acetate
10 cc H2O will take 7.26 g
Ethyl acetate at
20°C

See for interpretation of these
determinations Glasstone
2nd. ed. p. 793



any to $\frac{5}{100}$ Water precipitate

Acetone - Water Seidell (Atherton Solubilities 1916

page 7

20% Sugar (Cane sugar)
12 gm dissolve in 100 gm Solvent at 25° C
50% Dextrose 33 gm Acetone
50% Maltose 42 gm "

Methyl alcohol + Water + Propyl alcohol

p. 11

15 cc Methyl alcohol +
3 cc Propyl alcohol
+ 43 cc Water

---

p. 267 28 cc Alcohol + 3 cc Propyl acetate
+ 58 cc Water causes separation
24 cc Alcohol + 3 cc Propyl acetate
+ 8 cc Water to cause separation

Butanol Propanol H_2O

I

Aug 25/57

Butanol	Propanol	H_2O	
20 / 23 } 3cc	10 / 13 } 3cc	0 / 10 } 10cc	
+ (1cc)			homogeneous
23 } 2cc 25	13 } 1cc 14	10 } 20cc 30	II
25 } 5cc 30	14 } 3cc 17	30 } 3cc 33	cloudy
		33 } 1cc 34	turbid
	18 } 1cc	34 } 1cc 35	turbid
			clear
		39 } 4cc	turbid

total 18cc
lower 5.5 cc
upper 12.5 cc

[5cc butyl + 4cc dis prop + 8cc H_2O clear
(3cc " turbid)

III 10.5cc Water + 3 cc Propanol + 3 cc butanol
11.5cc " + 3cc Propanol + 4cc "

Homog

10.5 lower
17.5 total
7.0 upper

30 } 5.3cc 35.3	18 } 4cc 22	39 } 9cc 48

[5cc dissolves ...] turbid

IV

~~Serum Albu~~ Bovine Plasma Albumin [Armour]

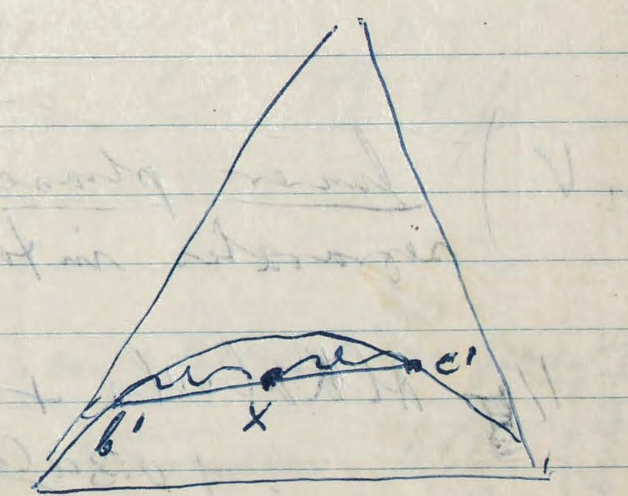
Glasstone p. 793
Textbook of Phys Chem.
II ...

critical point or plait point

Ip tie line

H_2O Butanol

A



B C

2.3 cc = 115 mgm of Alb

in ~~[illegible] + 4cc ∂p + ½ cc ∂p~~

10 cc of + 10cc H_2O + 2.3 cc H_2O

upper phase

[5 cc B + 4cc ∂p + 10 cc H_2O]

+ ½ cc ∂p + 2.3 cc H_2O

1.4cc

(Dr V) lower phase + 0.2 CaCl sol

separates into a lower } 1.2 cc

& upper } 0.25 cc

1/5 Alkohols + ~~3/4~~ 4/5 water

+ 0.3cc CaCl

upper phase (1.4 cc ~~[illegible]~~ 0.3 cc fall

separate a → 0.7

water 0.4 [illegible]

Alb 0.17

u → 0.7

Thursday July 26 /51

V 5cc B 4cc Jp 12 cc H_2O

total 22

lower 11

upper 11

VI 5cc B + 4cc Jp + 10 cc H_2O

total 19

lower 7

upper 12

therefore no separation — at [illegible] concentration

5 x 0.1cc of standard sol

[0.1 cc = 5 mgm]

9

3

1.2

3

1.5 cc

3

1.8 cc

.1 cc

1.9 cc + 0.4 = 2.3 cc

+ 1/2 cc of Jp

on adding J.P. sep.!

overall

10 mgm Alb

+ 5 cc Water

+ 15 cc J.p

[illegible]

redissolves on adding 1/2 cc

B + 1 cc

+ adding J.P.

or $\frac{0.35}{9}$ Hno

and $\frac{0.55}{9}$ Alk ±

$\frac{55}{35} = 1.57$

Better measurement of upper phase
Upper phase 10 cc + ½ cc B + 1 cc Hno
+ 0.5 cc all + 2.3 cc Alk solution

Cn. 3 cc of this one knows about

0.5
1.15
0.5
2.15 Hno

and 0.25 cc Alk

3.6
− 2.15
1.45 cc Hno

2.25
− 0.25
2 cc Alk

$\frac{2}{1.45} = 1.38$

$\frac{1.45}{3.45} = 42\%$

check: $\frac{1}{2}$ Alk $\frac{1}{2}$ H_2O

lower 11 cc → Alk $\frac{4}{5}$ cc = 2.2 cc
lower 11 cc → H_2O $11 \times \frac{4}{5}$ cc = 8.8 cc

upper 11 cc → Alk $11 \times \frac{7}{11}$ = 7 cc
upper 11 cc → H_2O $11 \times \frac{4}{11}$ = 4 cc

H_2O total 12.8
Alk " 9.2

On II

lower layer + 0.5 cc Call

(a) lower 5.4 cc − 0.5 = 4.9
(b) upper 1.6 cc 1.6
6.5 cc

$\frac{4.9}{6.5}$ ~~Alk~~ H_2O

$\frac{1.6}{6.5}$ ~~H_2O~~ Alk

75% Water

upper layer: lower a = 0.65 − 0.3 = 0.35
upper b = 0.55 cc

Dr. Szilard

ARMOUR CATALASE

DESCRIPTION, OCCURRENCE

Armour Catalase is prepared from pork liver in two forms: Powdered Catalase 30 which is soluble in aqueous solution and Powdered Catalase 15 which is non-soluble but conveniently dispersible in water. Powdered Catalase 15 is approximately half as potent as Powdered Catalase 30. Both preparations are quite stable for extended periods of time.

With the exception of certain species of microorganisms catalase is universally found in all forms of life. It usually occurs in greatest abundance in actively growing tissues; the concentration varies enormously from tissue to tissue. Because it decomposes hydrogen peroxide to oxygen and water catalase plays an important role in the metabolism of growing organisms. In the conversion of hydrogen peroxide, a potentially toxic substance, catalase liberates oxygen for dehydrogenation processes. Catalase is believed to be an indispensable constituent of aerobic tissues.

ACTION, SPECIFICITY

The optimal pH for the action of catalase is approximately 7, the exact point depending upon the length of incubation. Its activity diminishes rapidly on both sides of the neutral point.

Armour Catalase is one of the most effective enzymes known, being active at 0°C. although ordinarily used at room temperature and above. At 45°C. to 55°C. its activity diminishes and at 65°C. the enzyme is destroyed.

Armour Catalase decomposes hydrogen peroxide into water and molecular oxygen:

$$2H_2O_2 \xrightarrow{\text{catalase}} 2H_2O + O_2.$$

It is not an oxidizing enzyme and must be distinguished from the peroxidases. Peroxides, other than hydrogen peroxide, are not attacked by catalase.

Armour Catalase is not especially sensitive to heavy metals but can be readily inactivated by hydrocyanic acid, hydrogen sulfide and various sulfhydryl compounds, hydroxylamine, sodium azide, and heat. Salts tend to inhibit catalase action to a greater or lesser degree. However, secondary phosphates are thought to increase its activity because of their stabilizing effect on hydrogen ion concentration. Chloroform and other antiseptics are considered to decrease the activity only to a small extent. An excess of hydrogen peroxide (above 0.2 molar) reduces the activity of the enzyme.

MEASUREMENT OF ACTIVITY

A number of methods are used for the quantitative measurement of catalase activity. The following method is simple to follow and reproducible.

SOLUTIONS

Sodium acetate buffer - 2% glacial acetic acid adjusted to pH 7.2 with 30% NaOH solution.

Enzyme solution No. 1 - Weigh 50 mgs. Powdered Catalase 30 into 250 cc. volumetric flask; make up to mark with sodium acetate buffer solution.

Enzyme solution No. 2 - Measure 10 ccs of enzyme solution No. 1 into 250 cc volumetric flask; make up to mark with sodium acetate buffer solution.

Neutral (pH 7.0) phosphate-citrate buffer - Add 3.53 ccs 0.1 molar citric acid solution to 16.47 ccs 0.2 molar disodium phosphate solution and mix thoroughly.

0.25% H_2O_2 solution

10% H_2SO_4 solution

50% KI solution

0.1 N $Na_2S_2O_3$ solution

Add 1 cc of enzyme solution No. 2 to 20 ccs 0.25% H_2O_2 solution and 5 ccs neutral phosphate-citrate buffer, and maintain at 25°C. (room temperature) for 10 minutes. At the end of 10 minutes add 2.5 ccs 10% H_2SO_4 solution followed by 10 ccs 50% KI solution. Allow to stand for 15 minutes and then titrate with 0.1 N $Na_2S_2O_3$ solution until colorless. To prepare the blank add 2.5 ccs 10% H_2SO_4 solution to the substrate solution No. 2, and treat in the same way as the sample.

$$\frac{(\text{ccs of blank} - \text{ccs of enzyme solution No. 2})\ 0.0017}{\text{Sample weight (in gs.) in 1 cc.}} = \text{gs. } H_2O_2 \text{ /g. of sample}$$

PROPERTIES

The iron of catalase occurs in a stable ferric state and cannot be reduced with hydrosulfite. The enzyme is classed as a conjugated protein, the iron being found in a prosthetic group and is believed to be in the form of hematin or a closely related substance. According to modern thinking catalase may be a part of an enzyme-coenzyme system.

USES

1) To control or terminate the action of hydrogen peroxide in a given reaction mixture, e.g., after bleaching or sterilizing operations.

2) To liberate oxygen from hydrogen peroxide, e.g., in the production of foams and porous materials.

3) Intensification of the action of hydrogen peroxide.

ARMOUR AND COMPANY - RESEARCH DIVISION
Chicago 9, Illinois

115673 LITHO IN U. S. A.

Check: 1/19 in tube

lower layer 7 cc

upper layer 12 cc

upper layer $\frac{1.45}{3.45} \times 12$ cc $H_2O = 5$ cc

$\frac{2.00}{3.45} \times 12$ cc Alk. = 7 cc

lower layer $\frac{4.9}{6.5}$ 7 cc $H_2O = 5.3$ cc

8.7 cc Alk → 10.3 H_2O

$\frac{1.6}{6.5}$ 7 cc Alk = 1.73 cc

Should add up to 9 cc Alk (5 D + 4 Jp) 10 cc H_2O

Frisell (Bill)

10 }
16.3 }

5 }
10.3 }

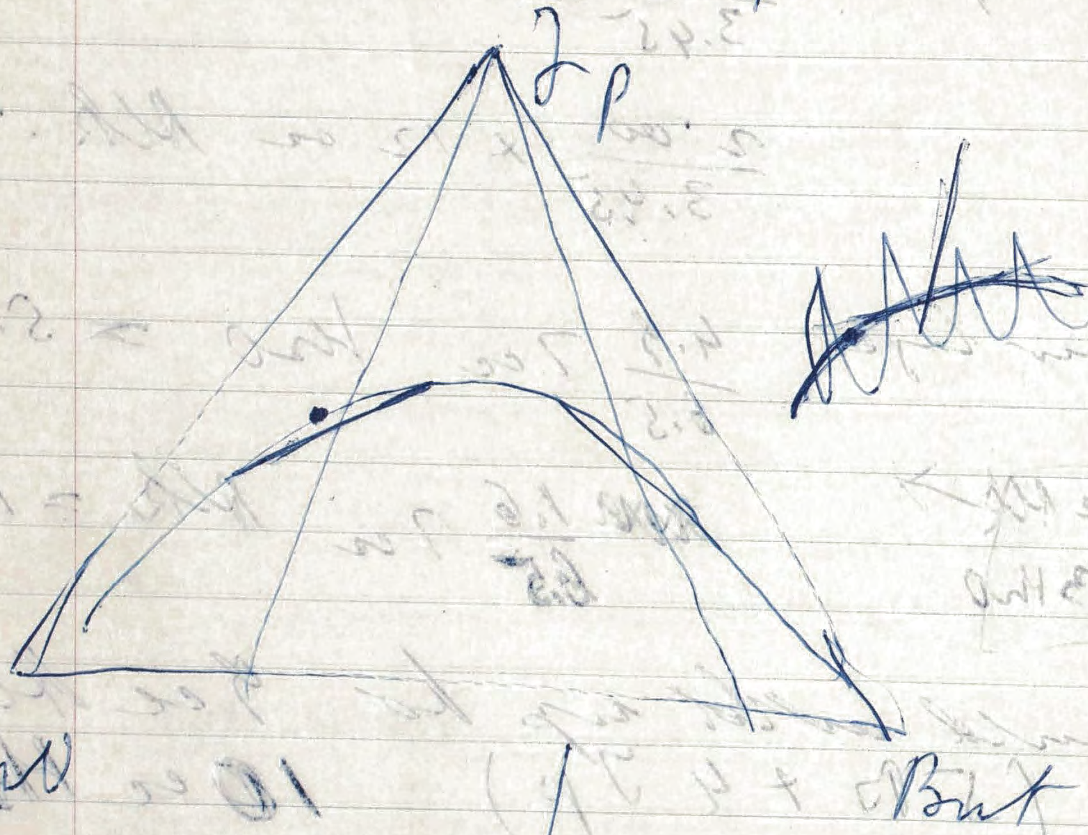
20 }
33.5 }

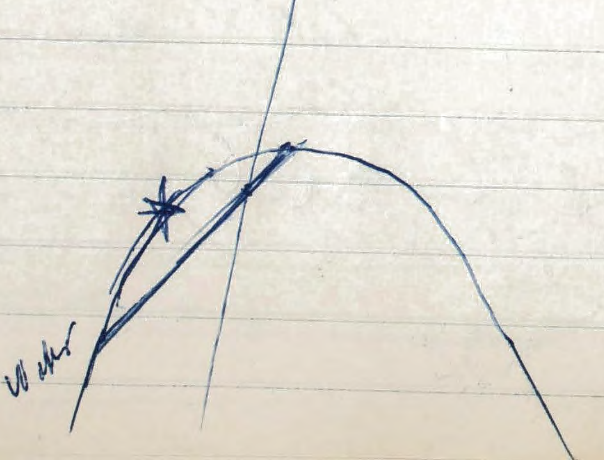
6.3 Butanol 5.3 Isp 13.5 H_2O

26 cc total

13 cc lower layer

Adding [illegible] propanol decreases lower layer





Friday July 27/51

Water-Butanol system

10 cc upper phase does not dissolve
more than 5 cc of standard solution of
(10%) Albumin i.e. 2½ mgm

Plait point

6 cc Butanol + 5 cc Isopropanol
+ 12 cc H_2O gave two
phases total 23 cc
lower 9 cc
upper 14 cc
a few drops of Isopropanol made
meniscus disappear

Water content $\left\{\frac{12}{23}\right\}$ slightly above 50%

6.3 cc B 5.43 p 14.5 H2O

27 total

15 lower

6.3 5.97 p 15 cc H2O

27.0 total

16 lower

60 mgm Tyrosine in ~ 100 cc

Ethyl isopropyl ether (5)

bis β dichlorethyl ether

(dichlorethene glycol dimethyl ether)

dichlorethyl carbonat (8)

methyl propyl ether 3 gm / 100 cc

Cellosolves:

Rubber Handbook page 203 / 223 / 1949

Ethanol, 2 butoxy- (∞)

(glycol monobutyl ether;
butyl cellosolve)

Diethylene glycol monobutyl ether
(butyl carbitol) ∞

Diethylene glycol mono ethyl ether
(carbitol) ∞

Diethylen monoalkylether acetate
∞

Diethylene glycol monobenzoate.
Diethylen glycol monomethyl ether
∞

2-ethoxy ethanol
(glycol monoethyl ether) ∞
("cellosolve")

2-ethoxy ethanol acetate
(β ethoxy ethyl acetate;
cellosolve acetate) 20 ppm / 100 c.

Diethylene glycol (8)

Enzymes

Invertase
Papain
Pepsin
Rennin
Urease

Drug Industrial
Biochemical
Co, Cleveland 28
Ohio

Primary Laboratories
1425 W 42nd Chicago 9

Bromelase

Catalase Technical Grade
4 ounces $2

H. M. Chemical Co Ltd
Los Angeles Cal

Sigma Chemical Co
4648 Easton Ave St Louis

Exp with Catalase 30

Catalase sol. 1 mg/cc

Phosphate buffer 6.8 p.H.
equal molar of both salts. (1/10 molar in both)

successful exp was made
with upper phase of 10 cc H_2O — 4 cc D.p. — 5 cc B

Take upper phase add equal vol
of Phosphate buffer and fill
sep funnel) to sep with butanol

then test (65 cc) aqueous phase which
is apt? of with ~~catalase~~ H_2O_2

Monday Aug 20

10 cc H_2O + 4 cc D p + 5 cc butanol

upper phase + 0.2 cc Catalase (1 mg/cc)
+ 10 cc Buffer

1/10 cc HNO_3 (30%)

2/40 meth 2/10 meth
2/100 thany 2/10 thany

---

12 cc H_2O + Cubalose (in 10 cc) 8 cc B 5.5 cc S.P.

1 cc of upper phase added to 10 cc of water + HNO_3 less blue — 0.2 cc of cubalose not in 10 cc water. — (1 mgm/cc)

---

100 mgm Cubalose in 5 cc water 40 mg/cc

10 cc Water 4 cc S.P. 5.5 cc B

gives 10 cc upper phase
8 cc lower phase (of this 1 cc is
0.4 cc is added to upper phase)
0.1
0.1
0.6 cc

precipitate forms slowly

$\frac{3}{10}$ empire red in upper phase
[13 cc]

Aug 21 Tuesday

53 cc H_2O
22 cc J.P
27 cc But
102

Lower phase 48 cc
upper phase 52 cc
100

1 cc more work

(In ice box. Have more phases and precipitate with in lower phase - shaken up and warmed; one phase small amount of precipitate)

at 11[45] am 1 cc of supernatant in 10 cc of water + 4 drops of this gives moderate acidity

30 min later (27°C); still acid but weak. —

0.2 cc of 1 mg/cc sol added to 10 cc upper phase gives concentration of $\frac{2}{100}$ mgm/cc

1 cc of X added to 10 cc H$_2$O $\simeq \frac{2}{100}$ mg/cc

or X = $\frac{2}{10}$ of mg/cc ; or by adding 40 cc of 40 mg/cc sol.

10 cc H$_2$O 4 cc Sp 5 cc B

giving 12.5 cc upper phase

10 cc of upper phase + 0.4 cc of Cabotase 40 mgm/cc gives clear sol at 11 10 am precipitate forms.

0.6 cc is 40 × 0.6 = 24 mgm %

in 10 cc i.e 2.4 mgm per cc

If this 1/10 cc in 10 cc thO gives fairly strong bubbling with 2 to 4 drops of thOr. [5 min reaction upper tube.

This is to be compared with earlier exp. in which 0.2 cc of stock of Catalase at 1 mgm/cc is put into 10 cc of water placed in ice box in the evening.

Wednesday Aug 22

at 10.30 in the morning 27°C

0.2 cc in 10 cc water 4 drops of thOr gave very strong reaction

after 30 min at 27°C still strong reaction

27° C

activity tested by adding 0.2 cc into 10 cc of water & 4 drops of H_2O_2
weak activity in

filtrate of
tested by adding 4 drops of H_2O_2
again tested at 2.50 pm
and found very weakly active
if at all

50 cc H_2O + 20 cc J.p. + 25.5 cc B

lower phase 35 cc
upper " 58
93

+ 1/2 cc H_2O_2 (30%)
+ 1 cc catalase extr.
after filtration (5 min) very
weak activity. —

10 cc H2O + 4 cc Dp + 5 cc B
10 cc upper phase + 1/2 of 1/10 cc
from
of 40 mg/cc stock

from this mixture of 1.15 pm
0.2 cc mixed 10 cc H2O + 4 drops H2O2
gives milk in medium bubbles

Stock H2O 20 cc Dp 26 cc B

lower phase 37 cc
upper 56 cc

~~93~~
93 (a comp 96 cc)

56 cc upper phase + 1 cc stock
Cortalose [at 40 mg/cc]
2.10 pm
[illegible] after 5 min
at 2.19 pm in [illegible]

46

Ultra upper

1.7 cc upper + 0.2 Alb stock
already precip

---

10 cc H_2O + 0.2 cc of 200 mgm/cc stock of alb

Bovine
Serum Alb. H
Stock sol 1 gm in 5 cc H_2O

upper (saved) 5.5 cc
12 cc ~~[illegible]~~ upper
(10 cc H_2O + 4 Dp + 5 B)
to 12 cc upper phase added 1/2 cc
of Alb. stock + 1/2 ~~B~~ Dp ; not clear

additional batch
10 cc H_2O + 4 Dp + 5 B

6.5 lower added to lower
12.5 upper added to upper
+ 1/2 cc Dp still not clear

10 cc H_2O + 4 Dp + 5.2 B
lower 6.5 cc added
upper 13 cc kept apart

To (this) is added from album stock

0.1 cc Alb from stock not clear
added 1/2 cc Dp. — + 3 cc H_2O + 0.3 Dp ~~+ 1/4 cc H_2O~~

Thursday Aug 23 4

10 cc H2O + 4 cc Dp + 5 cc B

lower
upper 8 cc
11.5

19.5

11 cc of upper phase
added 1/2 cc 1/64 Mol of Starch Iodin
turbid does not clear with Dp

8 cc lower phase + 1/4 cc is clear
1/4 cc
1/2 cc turbid

10 cc H2O + 4 Dp + 5 B
12 cc upper phase
0.6 cc of old Starch

Collodahues see
Ethanol

3613 (3)

Bros Labor. Inc. 607 W 43rd Street
N.Y.C.

Urease 1gm $2.50

Pan. Biochemicals Inc.
677 Lakeshore Blvd
Niagara Falls Ont.

Papain Powder

(2)

2,4 - Pentanediol (S) 2 methyl -
(α, α, α' trimethyl trimethylene glycol)

(S)

---

2 Pentanone oxime (S)
(methyl propyl ketoxime)

2 Pentanone 4 - hydroxy - 4 - methyl
(diacetone alcohol)

(∞)

1,3 - Butanediol (S)
(β butylene glycol; α methyl trimethylene glycol)

1,3 Butanediol, 3 methyl (S)
(γ iso amylen glycol)

1,4 - Butanediol ∞
(tetramethylene glycol;
1,4 - dihydroxybutane)

2,3 Butanediol ∞
(pseudobutylene glycol;
sym - dimethylethylene glycol)

(1) 1,6- Hexanediol (D.) hexamethylene glycol (solid)

2,3-Hexanediol (∞)
(2,3-dihydroxy hexane)

2,5 Hexanedione, DKA (∞)
acetonylacetone, symm-diacetylethane

1,6- Hexanediamine (V.S.) [Solid]
(hexamethylendiamine)

1,7- Heptanediol (S) liq at room temp
(heptamethylene glycol)

1 Pentanol (pri-n-amyl alkohol or butyl-carbinol) 2.7 gm/100 cc

1,2-Pentanediol ∞
(α-n-amylene glycol

1,4-Pentanediol ∞
(δ-pentylene glycol)

1,5-Pentanediol (penta-methylene glycol) ∞
thick liqu.

2 Pentanol 5.3 gm/100 cc
(methyl propyl carbinol or sec-act-amyl alkohol)

2,3-Pentane diol S (methyl ethylene glycol
or β-n-amylene glycol)

760

620

1033

1.23

-20 15.5

4.5° Fahrenheit

2.5° C $\frac{9}{5}$

672

542

-74°

-83

-78.5 C°

81

Lennon

MA 043859 by ab Mr / Mrs Rhodes
MU 45374

Ext 2594 at trust

Dr. Flett acting for Preston

Mrs Petersen :
Mrs Wort[:

{ Mrs Fine
Miss Jamieson

Wed 10 12 Benjamin
Fri 5-7 Washburn [illegible]