A. **Perkiraan Pembuatan Pati Kulit Singkong**

1 kg kulit singkong = 70 gram

Dalam penelitian ini pembuatan pati pisang sebanyak 10 kg kulit singkong dengan sampel sebanyak 16 sampel. Dengan demikian, dari 10 kg kulit singkong tersebut di dapatkan pati kulit singkong sebanyak 700 gram.

B. **Pembuatan Larutan**

1. Larutan NaOH 0,3 M

   Diketahui   : Molar   = 0,3 M

                     Volume   = 100 ml

                     Berat Molekul   = 40 gr/mol

   Rumus yang digunakan :

   $$\text{gram} = \text{BM} \times \text{V} \times \text{M}$$

   Maka;

   gram   = BM x V x M

   = 40 mgr/~~mmol~~ x 100 ~~ml~~ x 0,3 ~~mmol/ml~~

   = 1200 mgr

   = 1,2 gram

2. Larutan NaOH 0,1 M

   Diketahui   : Molar   = 0,1 M

                     Volume   = 250 ml

                     Berat Molekul   = 40 gr/mol

   Rumus yang digunakan :

   $$\text{gram} = \text{BM} \times \text{V} \times \text{M}$$

   Maka;

   gram   = BM x V x M

   = 40 mgr/~~mmol~~ x 250 ~~ml~~ x 0,1 ~~mmol/ml~~

   = 1000 mgr   = 1 gram

3. Larutan Asam Asetat CH_3COOH 20%

   Diketahui   : Volume   = 50 ml

                     Berat Molekul   = 60,05 gr/mol

$$= 1,05 \text{ gr/ml}$$

$$\% \qquad = 20\%$$

Rumus yang digunakan :

$$M_1 =$$

$$M_1 \times V_1 = M_2 \times V_2$$

Maka;

$$M_1 = \qquad\qquad\qquad M_2 =$$

$$M_1 = 1748,5 \qquad\qquad\qquad M_2 = 349,7$$

$$1748,5 \times V_1 = 349,7 \times 50 \text{ ml}$$

$$V_1 =$$

$$V_1 = 10 \text{ ml}$$

C. **Swelling Power**

    a.   Pati Kontrol

    Berat sampel   = 0,1 gr

        Berat tabung   = 54,23 gr

        Berat pasta + tabung   = 54,689 gr

        Berat pasta   = (54,689 - 54,23) gr

                              = 0,459 gr

        Swelling Power   =

                              = = 4,59 g/g

    b.   pH 6

    -    Pada T= 30^0C

        Berat sampel   = 0,1 gr

        Berat tabung   = 54,23 gr

        Berat pasta + tabung   = 54,853 gr

        Berat pasta   = (54,853 - 54,23) gr

                              = 0,623 gr

        Swelling Power   =

$$=$$
$$= 6{,}23 \text{ gr}$$

- Pada T = 40⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 55,095 gr
Berat pasta	= (55,095 - 54,23) gr
	= 0,865 gr

  Swelling Power =

  =

  = 8,65 gr

- Pada T= 50⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 55,164 gr
Berat pasta	= (55,164 -54,23) gr
	= 0,934 gr

  Swelling Power =

  =

  = 9,34 gr

- Pada T = 60⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 55,019 gr
Berat pasta	= (55,019 - 54,23) gr
	= 0,789 gr

  Swelling Power =

  =

  = 7,89 gr

c. pH 7

- Pada T= 30⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 54,853 gr
Berat pasta	= (55,575 - 54,23) gr
	= 1,345 gr
Swelling Power	=
	=
	= 6,23 gr

- Pada T = 40⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 55,792 gr
Berat pasta	= (55,792 - 54,23) gr
	= 1,562 gr
Swelling Power	=
	=
	= 15,62 gr

- Pada T = 50⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 55,617 gr
Berat pasta	= (55,617 -54,23) gr
	= 1,387 gr
Swelling Power	=
	=
	= 13,87 gr

- Pada T = 60⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 56,053 gr
Berat pasta	= (56,053 - 54,23) gr
	= 1,823 gr
Swelling Power	=

$$=$$

$$= 18,23 \text{ gr}$$

d. pH 8

-   Pada T= 30⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 55,995gr
Berat pasta	= (55,995 - 54,23) gr
	= 1,765 gr
Swelling Power	=

$$=$$

$$= 17,65 \text{ gr}$$

-   Pada T = 40⁰C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 56,427 gr
Berat pasta	= (56,427 - 54,23) gr
	= 2,197 gr
Swelling Power	=

$$=$$

$$= 21,97 \text{ gr}$$

-   Pada T = 50⁰C

| Berat sampel | = 0,1 gr |

Berat tabung	= 54,23 gr
Berat pasta + tabung	= 56,708 gr
Berat pasta	= (56,708 -54,23) gr
	= 2,478 gr
Swelling Power	=
	=
	= 24,78 gr

- Pada T = 60^0C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 57,103 gr
Berat pasta	= (57,103 - 54,23) gr
	= 2,873 gr
Swelling Power	=
	=
	= 2,873 gr

e. pH 9

- Pada T= 30^0C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 56,449 gr
Berat pasta	= (56,449 - 54,23) gr
	= 2,219 gr
Swelling Power	=
	=
	= 22,19 gr

- Pada T = 40^0C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr

Berat pasta + tabung	= 56,882 gr
Berat pasta	= (56,882 - 54,23) gr
	= 2,652 gr
Swelling Power	=
	=
	= 26,52 gr

- Pada T = 50^0C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 56,933 gr
Berat pasta	= (56,933 -54,23) gr
	= 2,703 gr
Swelling Power	=
	=
	= 27,03 gr

- Pada T = 60^0C

Berat sampel	= 0,1 gr
Berat tabung	= 54,23 gr
Berat pasta + tabung	= 56,756 gr
Berat pasta	= (56,756 - 54,23) gr
	= 2,526 gr
Swelling Power	=
	=
	= 25,26 gr

D. *Solubility*

a. Pati Kontrol

Volume supernatant	= 10 ml
Berat endapan kering	= 1,1351 gr
% Solubility	= x 100 %

$$= \text{ x } 100 \text{ \%}$$
$$= 11{,}315 \text{ gr/ml}$$

b. pH 6

- Pada T = 30⁰C

Volume supernatant	= 10 ml
Berat endapan kering	= 1,2326 gr
% Solubility	= x 100 %

  $$= \text{ x } 100 \text{ \%}$$
  $$= 12{,}326 \text{ gr/ml}$$

- Pada T = 40⁰C

Volume supernatant	= 10 ml
Berat endapan kering	= 1,6941 gr
% Solubility	= x 100 %

  $$= \text{ x } 100 \text{ \%}$$
  $$= 16{,}941 \text{ gr/ml}$$

- Pada T = 50⁰C

Volume supernatant	= 10 ml
Berat endapan kering	= 1,7832 gr
% Solubility	= x 100 %

  $$= \text{ x } 100 \text{ \%}$$
  $$= 1{,}7832 \text{ gr/ml}$$

- Pada T = 60⁰C

Volume supernatant	= 10 ml
Berat endapan kering	= 2,4693 gr
% Solubility	= x 100 %

  $$= \text{ x } 100 \text{ \%}$$
  $$= 24{,}693 \text{ gr/ml}$$

c. pH 7

- Pada T = 30^{0}C

Volume supernatant	= 10 ml
Berat endapan kering	= 1,8321 gr
% Solubility	= x 100 %
	= x 100 %
	= 18,321 gr/ml

- Pada T = 40^{0}C

Volume supernatant	= 10 ml
Berat endapan kering	= 1,9487 gr
% Solubility	= x 100 %
	= x 100 %
	= 19,487 gr/ml

- Pada T = 50^{0}C

Volume supernatant	= 10 ml
Berat endapan kering	= 2,1375 gr
% Solubility	= x 100 %
	= x 100 %
	= 21,375 gr/ml

- Pada T = 60^{0}C

Volume supernatant	= 10 ml
Berat endapan kering	= 2,7428 gr
% Solubility	= x 100 %
	= x 100 %
	= 27,428 gr/ml

d. pH 8

- Pada T = 30^{0}C

Volume supernatant	= 10 ml
Berat endapan kering	= 1,5924 gr
% Solubility	= x 100 %

$$= \text{ x } 100 \text{ \%}$$

$$= 15,924 \text{ gr/ml}$$

- Pada T = 40^0C

  Volume supernatant   = 10 ml

  Berat endapan kering   = 2,0021 gr

  % Solubility   = x 100 %

       = x 100 %

       = 20,021 gr/ml

- Pada T = 50^0C

  Volume supernatant   = 10 ml

  Berat endapan kering   = 2,2413 gr

  % Solubility   = x 100 %

       = x 100 %

       = 22,413 gr/ml

- Pada T = 60^0C

  Volume supernatant   = 10 ml

  Berat endapan kering   = 2,1912 gr

  % Solubility   = x 100 %

       = x 100 %

       = 21,912 gr/ml

e. pH 9

- Pada T = 30^0C

  Volume supernatant   = 10 ml

  Berat endapan kering   = 1,9761 gr

  % Solubility   = x 100 %

       = x 100 %

       = 19,761 gr/ml

- Pada T = 40^0C

Volume supernatant = 10 ml

Berat endapan kering = 2,3324 gr

% Solubility = x 100 %

= x 100 %

= 23,324gr/ml

- Pada T = 50^{0}C

Volume supernatant = 10 ml

Berat endapan kering = 2,6921 gr

% Solubility = x 100 %

= x 100 %

= 26,921 gr/ml

- Pada T = 60^{0}C

Volume supernatant = 10 ml

Berat endapan kering = 2,9498 gr

% Solubility = x 100 %

= x 100 %

= 29,498 gr/ml

E. **Kadar Gugus Karboksil**

Rumus yang digunakan :

x 100

a. pH 6

- Pada T = 30^{0}C

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,63 ml

% Gugus Karboksil = x 100 %

= 0,030 %

- Pada T = 40⁰C

Volume NaOH native acetate = 0,43 ml

Berat sampel   = 3 gram

Volume NaOH (titrasi)   = 0,67 ml

% Gugus Karboksil = x 100 %

= 0,036 %

- Pada T = 50⁰C

Volume NaOH native acetate = 0,43 ml

Berat sampel   = 3 gram

Volume NaOH (titrasi)   = 0,80 ml

% Gugus Karboksil = x 100 %

= 0,056 %

- Pada T = 60⁰C

Volume NaOH native acetate = 0,43 ml

Berat sampel   = 3 gram

Volume NaOH (titrasi)   = 0,80 ml

% Gugus Karboksil = x 100 %

= 0,056 %

b. pH 7

- Pada T = 30⁰C

Volume NaOH native acetate = 0,43 ml

Berat sampel   = 3 gram

Volume NaOH (titrasi)   = 0,50 ml

% Gugus Karboksil = x 100 %

= 0,011 %

- Pada T = 40⁰C

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,63 ml

% Gugus Karboksil = x 100 %

= 0,036 %

- Pada T = 50^0C

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,77 ml

% Gugus Karboksil = x 100 %

= 0,051 %

- Pada T = 60^0C

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,67 ml

% Gugus Karboksil = x 100 %

= 0,036 %

c. pH 8

- Pada T = 30^0C

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,70 ml

% Gugus Karboksil = x 100 %

= 0,041 %

- Pada T = 40^0C

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,77 ml

% Gugus Karboksil   = x 100 %

                               = 0,051 %

-       Pada $T = 50^0C$

Volume NaOH native acetate = 0,43 ml

Berat sampel   = 3 gram

Volume NaOH (titrasi)   = 0,83 ml

% Gugus Karboksil   = x 100 %

                               = 0,060 %

-       Pada $T = 60^0C$

Volume NaOH native acetate = 0,43 ml

Berat sampel   = 3 gram

Volume NaOH (titrasi)   = 0,87 ml

% Gugus Karboksil   = x 100 %

                               = 0,066 %

d. pH 9

- Pada $T = 30^0C$

    Volume NaOH native acetate = 0,43 ml

    Berat sampel   = 3 gram

    Volume NaOH (titrasi)   = 0,53 ml

    % Gugus Karboksil   = x 100 %

                                 = 0,015 %

-       Pada $T = 40^0C$

Volume NaOH native acetate = 0,43 ml

Berat sampel   = 3 gram

Volume NaOH (titrasi)   = 0,63 ml

% Gugus Karboksil   = x 100 %

                               = 0,030 %

-       Pada $T = 50^0C$

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,77 ml

% Gugus Karboksil = x 100 %

= 0,051 %

- Pada T = 60^{0}C

Volume NaOH native acetate = 0,43 ml

Berat sampel = 3 gram

Volume NaOH (titrasi) = 0,77 ml

% Gugus Karboksil = x 100 %

= 0,051 %