

LAMPIRAN

1. Perhitungan

1.1 Perhitungan Viskositas

- Perhitungan μ_o

$$\mu_o = \pi \times \rho \times r \times \frac{t}{8 \times v \times l} \times 10$$

Keterangan :

μ_o = viskositas awal (kg/ms)

π = 3,14

ρ = densitas awal (g/ml)

r = jari-jari bola = 0,081 cm

t = waktu alir (s)

v = volume zat cair (ml)

l = panjang batas atas dan batas bawah (cm)

$$\mu_o = \pi \times \rho \times r \times \frac{t}{8 \times v \times l}$$

$$\mu_o = 3,14 \times 1,0236 \times 0,081 \times \frac{1,36}{8 \times 5 \times 3}$$

$$\mu_o = 0,002951 \text{ kg/m.s}$$

- Pengaruh suhu dengan viskositas

$$\frac{\mu_x}{\mu_o} = \left(\frac{T}{303} \right)^n$$

Keterangan :

μ_x = viskositas pada T (kg/ms)

μ_o = viskositas awal (kg/ms)

T = suhu percobaan (K)

n = konstanta viskositas zat cair (didapat dari buku Mc. Cabe, appendix table 9)

$$\mu_o = 0,002951 \text{ kg/m.s}$$

- Variabel Suhu (Teoritis)

Suhu 30°C

$$\frac{\mu_x}{\mu_o} = \left(\frac{T}{303} \right)^n$$

$$\frac{\mu_x}{0,002951 \frac{kg}{m.s}} = \left(\frac{303}{303} \right)^{0,9}$$

$$\mu_x = 0,002951 \text{ kg/m.s}$$

Suhu 35°C

$$\frac{\mu_x}{0,002951 \frac{kg}{ms}} = \left(\frac{308}{303}\right)^{0,9}$$

$$\mu_x = 0,002994 \text{ kg/m.s}$$

Suhu 40°C

$$\frac{\mu_x}{0,002951 \frac{kg}{ms}} = \left(\frac{313}{303}\right)^{0,9}$$

$$\mu_x = 0,003038 \text{ kg/m.s}$$

Suhu 45°C

$$\frac{\mu_x}{0,02951 \frac{kg}{ms}} = \left(\frac{318}{303}\right)^{0,9}$$

$$\mu_x = 0,003082 \text{ kg/m.s}$$

Suhu 50°C

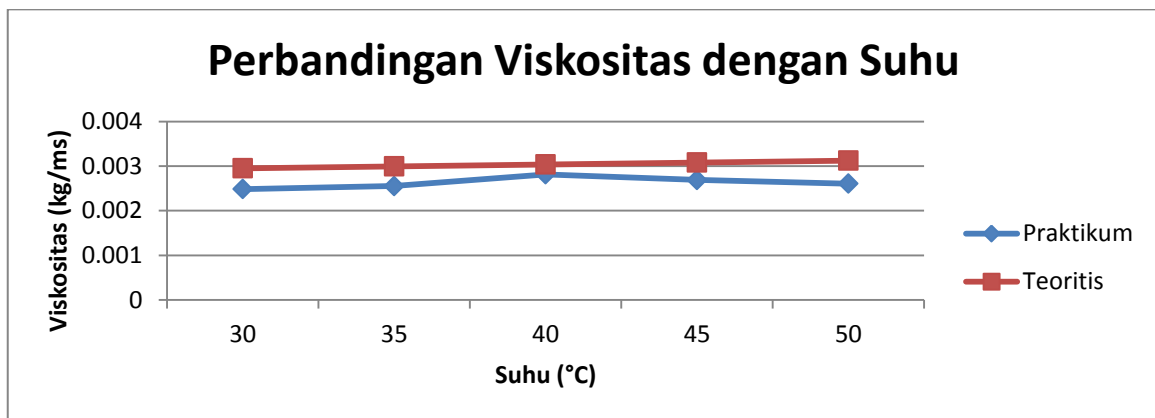
$$\frac{\mu_x}{0,002951 \frac{kg}{ms}} = \left(\frac{323}{303}\right)^{0,9}$$

$$\mu_x = 0,003125 \text{ kg/ms}$$

- Variabel Suhu (Percobaan)

Suhu	Densitas		t ₀	t _x	μ ₀	μ _{praktik}	μ _{teoritis}
	Sebelum	Sesudah					
30	1,0236	1,0196	1,36	1,15	0,002951	0,002485	0,002951
35	1,0236	1,0208	1,36	1,18	0,002951	0,002553	0,002994
40	1,0236	1,0224	1,36	1,30	0,002951	0,002817	0,003038
45	1,0236	1,0240	1,36	1,24	0,002951	0,002691	0,003082
50	1,0236	1,0256	1,36	1,20	0,002951	0,002609	0,003125

Grafik hubungan suhu dengan viskositas



- Pengaruh waktu dengan viskositas

Perhitungan pengaruh waktu terhadap viskositas

$$\mu_x = \frac{t_x \times \rho_x}{t_o \times \rho_o} \times \mu_o$$

Keterangan :

μ_x = viskositas akhir (kg/ms)

t_x = waktu akhir

ρ_x = densitas akhir (gr/ml)

μ_o = viskositas awal (kg/ms)

t_o = waktu awal

ρ_o = densitas awal (gr/ml)

- Variabel waktu (teoritis)

Menit ke 40

$$\mu_x = \frac{t_x \times \rho_x}{t_o \times \rho_o} \times \mu_o$$

$$\mu_x = \frac{40 \times 1,008}{40 \times 1,0236} \times 0,002951 \text{ kg/ms}$$

$$\mu_x = 0,002906 \text{ kg/ms}$$

Menit ke 50

$$\mu_x = \frac{50 \times 1,01}{40 \times 1,0236} \times 0,002951 \text{ kg/ms}$$

$$\mu_x = 0,003639 \text{ kg/ms}$$

Menit ke 60

$$\mu_x = \frac{60 \times 1,012}{40 \times 1,0236} \times 0,002951 \text{ kg/ms}$$

$$\mu_x = 0,004376 \text{ kg/ms}$$

Menit ke 70

$$\mu_x = \frac{70 \times 1,0132}{40 \times 1,0236} \times 0,002951 \text{ kg/ms}$$

$$\mu_x = 0,005111 \text{ kg/ms}$$

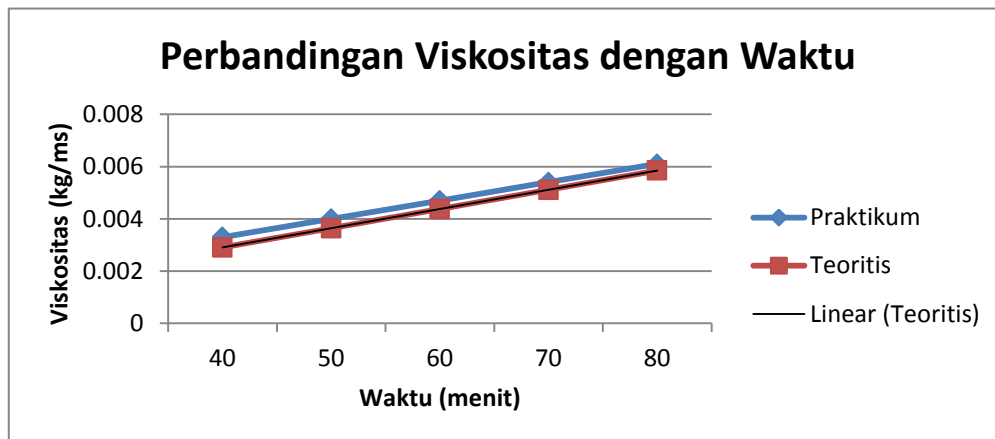
Menit ke 80

$$\mu_x = \frac{80 \times 1,0148}{40 \times 1,0236} \times 0,002951 \text{ kg/ms}$$

$$\mu_x = 0,00585 \text{ kg/ms}$$

Hasil Pengaruh Waktu Terhadap Viskositas

Waktu	Viskositas Praktikum (kg/ms)	Viskositas Teoritis (kg/ms)
40	0,0033	0,002906
50	0,0040	0,003639
60	0,0047	0,004376
70	0,0054	0,005111
80	0,0061	0,005850

Grafik Hubungan Waktu dengan Viskositas

2. Foto



Proses Running Alat Evaporator Vacuum



Hasil Evaporasi