LAMPIRAN III

Perhitungan Stoikiometrik Sintesis Larutan Prekursor

Persamaan Reaksi :

1. Sintesis Prekursor Fe

   $Fe_3O_4 + 8HCl \rightarrow FeCl_2 + 2FeCl_3 + 4H_2O$

2. Sintesis Prekursor Ba

   $BaCO_3 + 2HCl \rightarrow BaCl_2 + CO_2 + H_2O$

$BaFe_{12}O_{19}$ = 1 gram

Ba = $\frac{4.2915625}{34.7353125}$ x 1 gram = 0.1236 gr

Fe = $\frac{20.94375}{34.7353125}$ x 1 gram = 0.6030 gr

O = $\frac{9.5}{34.7353125}$ x 1 gram = 0.2735 gr

Ba = $\frac{1}{32}$ x Ar.Ba = 4.29

Fe = $\frac{12}{32}$ x Ar.Fe = 20.94

O = $\frac{19}{32}$ x Ar.O = 9.5 +

= 34.7353125

$BaCO_3$

Ba = $\frac{1}{5}$ x Ar.Ba = 27.466

C = $\frac{1}{5}$ x Ar.C = 2.4022

O = $\frac{3}{5}$ x Ar.O = 9.6 +

= 39.4682

Fe_3O_4 = 0.01 gr

Fe = $\frac{3}{7}$ x Ar.Fe = 23.93

O = $\frac{4}{7}$ x Ar.O = 9.14

Fe = $\frac{23.93}{33.07}$ = 0.723 x 0.01

= 0.00723

Massa Fe_3O_4 yang diperlukan = 000723 gr

Massa $BaCO_3$ yang diperlukan

Ba = 0.6029 x 0.1199

= 0.0722

$BaCO_3$ = m

$= \frac{27.466}{39.4682}$ x m = 0.0722

m = 0.0104 gram

Massa $BaCO_3$ yang diperlukan = 0.0104 gram

Volume HCl pada Prekursor Ba

Mol $BaCO_3 = \frac{0.0104}{197.34\ gr/mol}$ = 5.27 e-5

2HCl = 5.27 e-5

HCl = 2.63 e-5 x Berat Molekul HCl

mHCl = 2.63 e-5 x 36.46

= 0.000958 gr

Volume = $\frac{m}{\rho} = \frac{0.000958}{1.49}$

Volume = 0.0064 L

= 6.4 mL

Volume HCl pada Prekursor Fe

Mol $Fe_3O_4 = \frac{0.834}{231.55\ gr/mol}$ = 3.59 e-3

8HCl = 3.59 e-3

HCl = 4.48 e-3

mHCl = 4.48 e-4 x Berat Molekul HCl

mHCl = 0.00448 gr

Volume = $\frac{m}{\rho} = \frac{0.00448}{1.49}$

Volume = 0.0030 L

= 3.2 mL