

1 #1

1.2 M NaOH 65 mL \Rightarrow .12 M NaOH

$$\left(\frac{2.2 \text{ mol NaOH}}{L} \right) \left(\frac{105 \text{ mL}}{L} \right) = .145 \text{ mol NaOH}$$

$$\left(\frac{1.45 \text{ mol NaOH}}{L} \right) \left(\frac{405 \text{ mL}}{L} \right) = 15.725 \text{ mol NaOH}$$

2.4.1 L 3.5 M 46.50g ~~2.4~~ $\frac{202}{3296} = 64.00$

$$\left(\frac{3.5 \text{ mol}}{L} \right) (1L) = 3.5 \text{ mol} \quad \frac{2808}{2}$$

$$\left(\frac{3.5 \text{ mol}}{L} \right) \left(\frac{92.08 \text{ g}}{\text{mol}} \right) = 323.25 \text{ g}$$

B. 2.52 1.25 M Ba(NO₃)₂

$$\left(\frac{1.25 \text{ mol}}{L} \right) \left(\frac{2.52 \text{ L}}{L} \right) = 4.375 \text{ mol} \quad \frac{132.33}{2802}$$

$$\left(\frac{4.375 \text{ mol}}{L} \right) \left(\frac{261.35 \text{ g}}{\text{mol}} \right) = 1143.4 \text{ g Ba(NO}_3)_2$$

3. A. 20g NaOH 100 mL of water
 (20g NaOH) (40g/mol) = .5 mol NaOH

$$\left(\frac{.5 \text{ mol NaOH}}{L} \right) = 125 \text{ M NaOH}$$

B. 14g NH₄OH 100 mL 157 50 mL
 (14g NH₄OH) (17g/mol) = 99.96g
 $\frac{14 \text{ g}}{157} = .14 \text{ mol}$

$$\frac{.14 \text{ mol}}{1.5 \text{ L}} = .0933 \text{ M}$$

OVER

3. c. 32.75 $\frac{1}{2}$ POY 52 SOc iL

3.03
30.57
64.100

$$(32.75) \left(\frac{1 \text{ unit}}{505} \right) = 33 \text{ unit } \frac{1}{2} \text{ POY}$$

$$\frac{(.33 \text{ unit } \frac{1}{2} \text{ POY})}{.52} = .66 \text{ M } \frac{1}{2} \text{ POY}$$

4. .052 (COCK)₂ 2 M SOc iL = 32 (COCK)₂

$$\left(\frac{2 \text{ unit}}{2} \right) (.052) = 0.104 \text{ (COCK)}_2$$

$$(.01 \text{ unit } (2 \text{ (COCK)}_2) \left(\frac{34.15}{\text{unit}} \right) = \underline{.3415 \text{ (COCK)}_2}$$

5. 26.425 (NH₄)₂ SO₄ .052 SOc iL

$$(26.425) \left(\frac{1 \text{ unit}}{132.165} \right) = 199 \text{ unit } (NH_4)_2 SO_4$$

$$\frac{(1.99 \text{ unit})}{.052} = 3.82 \text{ M } (NH_4)_2 SO_4$$

6. 345 K₂SO₃ \Rightarrow ? unit .524 K₂SO₃

$$(345) \left(\frac{1 \text{ unit}}{162.555} \right) = 2.12 \text{ unit } K_2SO_3$$

$$\frac{(2.12 \text{ unit } K_2SO_3) \left(\frac{1}{.524} \right)}{.524} = 2.00372$$

$$\frac{.524 \text{ unit}}{.524} = 3.2 \text{ unit}$$

410 #1 (cont)

#7 $294.3 \text{ H}_2\text{SO}_4$ in 1 kg H₂O
 $(294.3 \text{ g H}_2\text{SO}_4) \times \frac{1 \text{ mol}}{98.08 \text{ g}} = 3 \text{ mol H}_2\text{SO}_4$

$$\frac{3 \text{ mol H}_2\text{SO}_4}{1 \text{ kg H}_2\text{O}} = 3 \frac{\text{mol}}{\text{kg}} = 3 \text{ m H}_2\text{SO}_4$$

B. 63.0 g HNO_3 in $.25 \text{ kg H}_2\text{O}$
 $(63.0 \text{ g HNO}_3) \times \frac{1 \text{ mol}}{63.0 \text{ g}} = 1 \text{ mol HNO}_3$

$$\frac{1 \text{ mol HNO}_3}{.25 \text{ kg}} = 4 \text{ mol/kg} = 4 \text{ m HNO}_3$$

C. $10.5 \text{ kg H}_2\text{O}$ in $300 \text{ g H}_2\text{O}$

$$105 \times \frac{1 \text{ mol}}{18 \text{ g}} = .58 \text{ mol H}_2\text{O}$$

$$\frac{.25 \text{ mol H}_2\text{O}}{.3 \text{ kg H}_2\text{O}} = .83 \frac{\text{mol}}{\text{kg}} = .83 \text{ m H}_2\text{O}$$

B. A $4.5 \text{ m H}_2\text{SO}_4$ in 1 kg H₂O
 $\frac{4.5 \text{ m}}{1 \text{ kg}} = 4.5 \text{ mol H}_2\text{SO}_4$

$$(4.5 \text{ mol H}_2\text{SO}_4) \times \frac{98.08 \text{ g}}{1 \text{ mol}} = 441.4 \text{ g H}_2\text{SO}_4$$

B. 1 m HNO_3 in $2 \text{ kg H}_2\text{O}$

$$\frac{1 \text{ mol}}{2 \text{ kg}} = .5 \text{ mol HNO}_3$$

$$(2 \text{ mol HNO}_3) \times \frac{63.0 \text{ g}}{1 \text{ mol}} = 126 \text{ g HNO}_3$$

B.C. 3.5 gm MgO_2 in 95.5 g H_2O

$$\left(3.5 \frac{\text{mol}}{\text{kg}} \right) \left(.45 \text{ kg} \right) = 1.575 \text{ mol } \text{MgO}_2$$

$$\left(1.575 \text{ mol } \text{MgO}_2 \right) \left(\frac{95.5 \text{ g}}{\text{mol}} \right) = 150 \text{ g } \text{MgO}_2$$

9. 171 g Ca(OH)_2 in 275 g H_2O

$$\left(171 \text{ g} \right) \left(\frac{\text{mol}}{74 \text{ g}} \right) = .05 \text{ mol } \text{Ca(OH)}_2$$

$$\frac{.05 \text{ mol}}{275 \text{ kg}} = .182 \text{ m } \text{Ca(OH)}_2$$

10. 755 g Ca(OH)_2 in 2000 g H_2O

$$\left(755 \text{ g} \right) \left(\frac{\text{mol}}{74 \text{ g}} \right) = 10.2 \text{ mol } \text{Ca(OH)}_2$$

$$\left(10.2 \text{ mol } \text{Ca(OH)}_2 \right) \left(\frac{1 \text{ kg}}{1000 \text{ g}} \right) = .0102 \text{ mol } \text{Ca(OH)}_2$$

OR: $\frac{10.2 \text{ mol}}{1000 \text{ kg}} = .0102 \text{ mol } \text{Ca(OH)}_2$

11. 9875 g H_2O in 1.25 mol SO_2

$$\frac{9875 \text{ g}}{18 \text{ g}} = 548.6 \text{ mol } \text{H}_2\text{O}$$

$$V = 9375 \text{ mol } \text{Ca(OH)}_2$$

(5)

$$10. \frac{.16 \text{ mol}}{.5 \text{ mol}} = \boxed{.32 \text{ kg}}$$

$$11. 1.25 \frac{\text{mol}}{\text{kg}} + 250 \text{ g H}_2\text{O} = ? \text{ g CaH}_2\text{O}_2$$

$$\left(1.25 \frac{\text{mol}}{\text{kg}} \times .25 \text{ kg} \right) = .3125 \text{ mol CaH}_2\text{O}_2$$

$$\left(.3125 \text{ mol CaH}_2\text{O}_2 \times \frac{180.15 \text{ g}}{\text{mol}} \right) = \boxed{165.92 \text{ g CaH}_2\text{O}_2}$$

$$12. 65 \text{ g NaOH}, .45 \text{ m ratio} = ? \text{ L H}_2\text{O}$$

$$\left(65 \text{ g NaOH} \times \frac{1 \text{ mol}}{38.99 \text{ g}} \right) = 1.11 \text{ mol NaOH}$$

$$\frac{1.11 \text{ mol NaOH}}{.45 \text{ mol}} = 2.47 \text{ kg H}_2\text{O} = \boxed{2.47 \text{ L H}_2\text{O}}$$

$$\left(\text{Density of H}_2\text{O} = \frac{1 \text{ kg}}{\text{L}} \right)$$

4100 #1 (cont)

12. 65g Al₂O₃ + 45 wt % SO₂ = 28650

$$(65g \text{ Al}_2\text{O}_3) \left(\frac{1 \text{ unit}}{58.44g} \right) = 1.11 \text{ unit Al}_2\text{O}_3$$

$$\frac{(1.11 \text{ unit Al}_2\text{O}_3) \times 45 \text{ wt \%}}{41g \text{ Al}_2\text{O}_3}$$

$$1.11 = .45 \times$$

$$(2.46 \text{ kg Al}_2\text{O}_3) \left(\frac{1 \text{ kg}}{41g} \right) = 2.46 \text{ kg Al}_2\text{O}_3$$



13. A. 10g SO₂ in 60g Al₂O₃

$$\frac{10g}{70g} \times 100 = 14.3\% \text{ SO}_2$$

B. 63g Al₂O₃ in 12.0g SO₂

$$\frac{63}{12.63} \times 100 = 4.99\% \text{ Al}_2\text{O}_3$$

14. 25g Al₂O₃ in 5L Al₂O₃ = 500g Al₂O₃

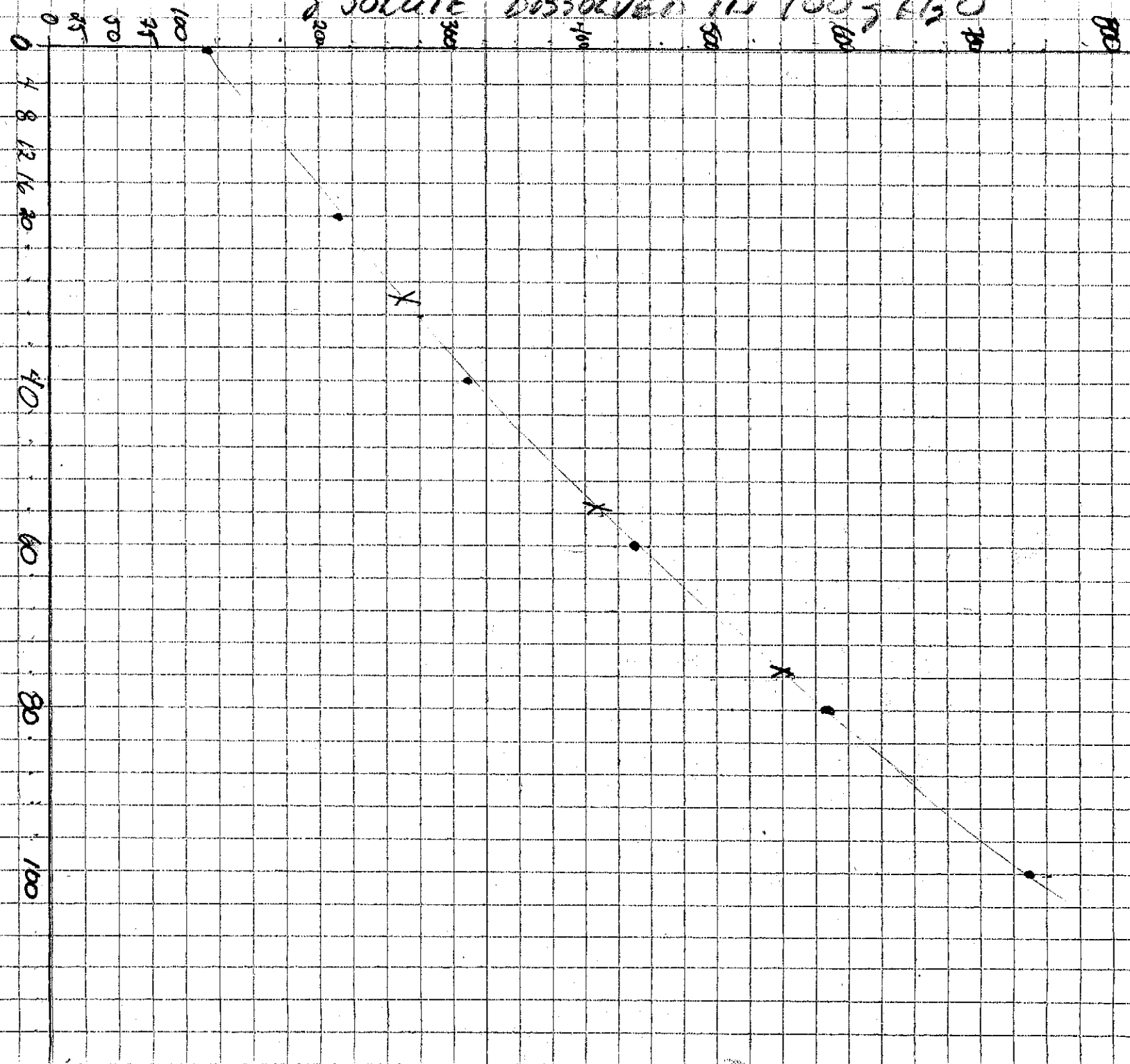
$$\frac{25g}{5025g} \times 100 = .4975\% \text{ Al}_2\text{O}_3 = \frac{1000}{2009}$$

5th page B

15.

g SOLUTE DISSOLVED IN 100 g H₂O

TEMPERATURE IN DEGREES CELSIUS (PAILED)



5. a. As TEMPERATURE INCREASES, SOLUBILITY OF

AgNO_3 INCREASES

b. $30^\circ\text{C} \approx 860\text{g}$ AgNO_3
 $55^\circ\text{C} \approx 1055\text{g}$ AgNO_3
 $75^\circ\text{C} \approx 1605\text{g}$ AgNO_3

c. $\sim 35^\circ\text{C}$

d. UNSATURATED

at $35^\circ\text{C} \sim 275\text{g}$ AgNO_3 DISSOLVE IN 100g H_2O
IF 325g AgNO_3 ADDED TO 75g H_2O AT 35°C ,
NOT ALL THE SOLUTE WOULD DISSOLVE AND
SOLUTION WOULD BE SATURATED

16. $\sim 81\text{g}$ KNO_3