ENGR 240
HW # 8

1 a) T_m (Al) = 660.35 °C

b) ≈ 2 wt% Cu

c) 66.8 wt% Al (eutectic)

(All answers are Approximate)

2) a) • phases : $\eta_2 + \theta$

• comp : $\eta_2 \rightarrow$ 28 wt% Al ; $\theta \rightarrow$ 47 wt% Al

• Amount : $W_\theta = \frac{35-28}{47-28} = 0.37 =$ 37 %

$W_{\eta_2} =$ 63 %

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b) • phases : β only

• Comp : $\beta \rightarrow$ 10 wt% Al

• AMT : $W_\beta =$ 100 %

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c) • $\epsilon_2 + L$

• $\epsilon_2 \rightarrow$ 23 wt% Al ; $L \rightarrow$ 30 wt% Al

• $W_{\epsilon_2} = \frac{30-25}{30-23} =$ 71 % ; $W_L =$ 29 %

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3. $C_o = \frac{15g}{15g + 5g} = 75$ wt% Al

a) PRIMARY θ = none

b) PRIMARY K = look just above 548 °C

$$\frac{75 - 66.8}{94.35 - 66.8} = 0.30 \Rightarrow 0.30(20g) = \boxed{6.0\ g}$$ $\boxed{\text{comp} = 94\text{ wt\% Al}}$

c,d) look just below 548 (at 547 °C) for total amounts of phases:

TOTAL K → $\frac{75 - 47.5}{94.35 - 47.5} = 0.587 \Rightarrow 0.587(20g) = 11.7g$

TOTAL K

↓

$20 - 11.7 =$

$8.3g$ TOTAL θ

* EUTECTIC K = $11.7g - 6.0g = \boxed{5.7g}$ $\boxed{\text{comp} = 94\text{ wt\% Al}}$

* EUTECTIC θ = $8.3g - 0 = \boxed{8.3g}$ $\boxed{\text{comp} = 47.5\text{ wt\% Al}}$