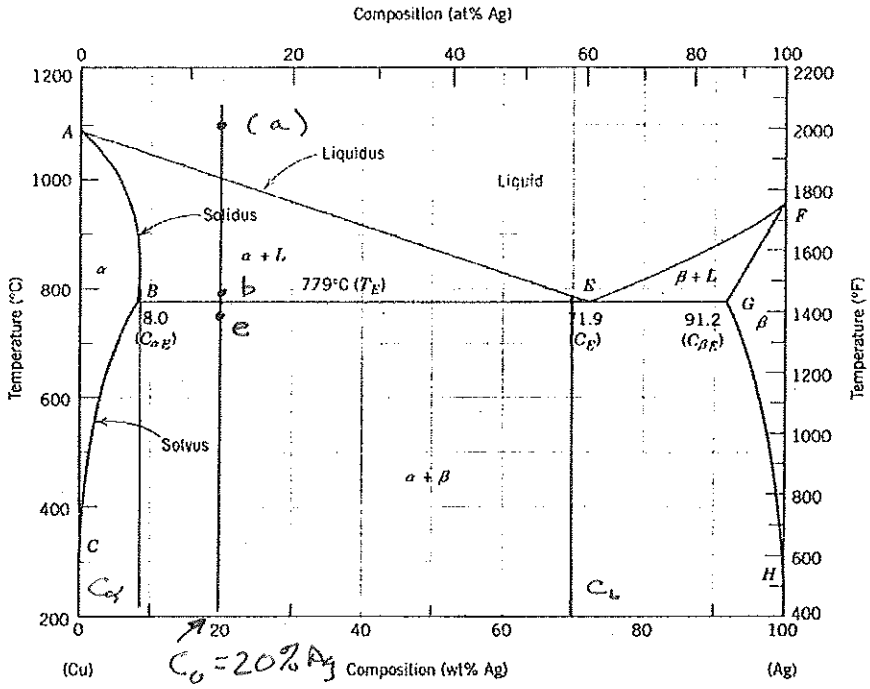

The alloy is composed of 20 pounds silver (Ag) and 80 pounds copper (Cu).

3a. (10 pts) What phase(s) are present, and what is the composition of each phase at 1100°C?

All Liquid : C_L = 20% Ag, 80% Cu

3b. (10 pts) What phase(s) are present, and what is the composition of each phase at 780°C?

α + L are present

C_α = 8% Ag 92% Cu C_L = 71% Ag 29% Cu

3c. (10 pts)

i) How many pounds of solid (α) would be present at 780°C?

$$wt\ of\ \alpha = \frac{C_L - C_o}{C_L - C_\alpha} \cdot 100\,lb = \frac{71-20}{71-8} \cdot 100\,lb$$

(81 lb)

ii) How many pounds of liquid?

$$wt\ of\ L = \frac{C_o - C_\alpha}{C_L - C_\alpha} \cdot 100\,lb = \frac{20-8}{71-8} \cdot 100\,lb$$

(19 lb)

3d. (5 pts) What is the eutectic temperature of Cu-Ag? 779°C

3e. (10 pts)

i. How many pounds of eutectic microstructure would be present at 778°C?

The liquid in 3c transforms into eutectic microstructure

$$\therefore Wt\ of\ eutectic = \left(\frac{C_o - C_\alpha}{C_L - C_\alpha}\right)_{780°C} \cdot 100\,lb = \boxed{\frac{20-8}{71-8} \cdot 100\,lb}$$

(19 lb)

ii. Sketch the microstructure and label the features you are trying to sketch.

layers of α & β (eutectic microstructure)

primary α