GLY 4200 Homework Exercise 5

## **Binary Phase Diagrams - Solid Solution Behavior**

1. On Figure 1, outline the liquidus in green, the solidus in brown.

2. Trace the behavior of the melt at A as it cools from 1950°C to 1400°C. Show the path

followed by the liquid in <u>red</u>, and by the solid in <u>blue</u> on the first attached diagram.

At what temperature do the first crystals appear?\_\_\_\_\_

What is the composition of the first crystals?\_\_\_\_\_\_At what temperature is

the liquid entirely converted to the solid?\_\_\_\_\_

What is the composition of the final liquid phase?

What is the composition of the liquid phase at 1700°C?

What is the composition of the solid at 1700°C?\_

3. Using Figure 2, trace the behavior of composition B as it is heated from 1320°C to 1800°C.

Again, show the path followed by the solid in <u>blue</u> and the path followed by the liquid in <u>red</u>.

At what temperature does the first liquid appear?\_\_\_\_

What is the composition of the liquid at this temperature?

What is the composition of the solid at this temperature?

At what temperature does the last solid disappear?\_\_\_\_\_

What is the composition of the last solid?

What is the liquid composition at 1800°C?\_\_\_\_\_

What is the liquid composition at 1450°C?\_\_\_\_\_

What is the solid composition at 1450°C?\_\_\_\_\_

Grading - 1 point for each colored line 1 point per blank  $\pm 20^{\circ}$ C and  $\pm 4\%$  composition  $\pm 40^{\circ}$ C and  $\pm 8\%$  composition, -<sup>1</sup>/<sub>2</sub> point

Total - 20 points

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