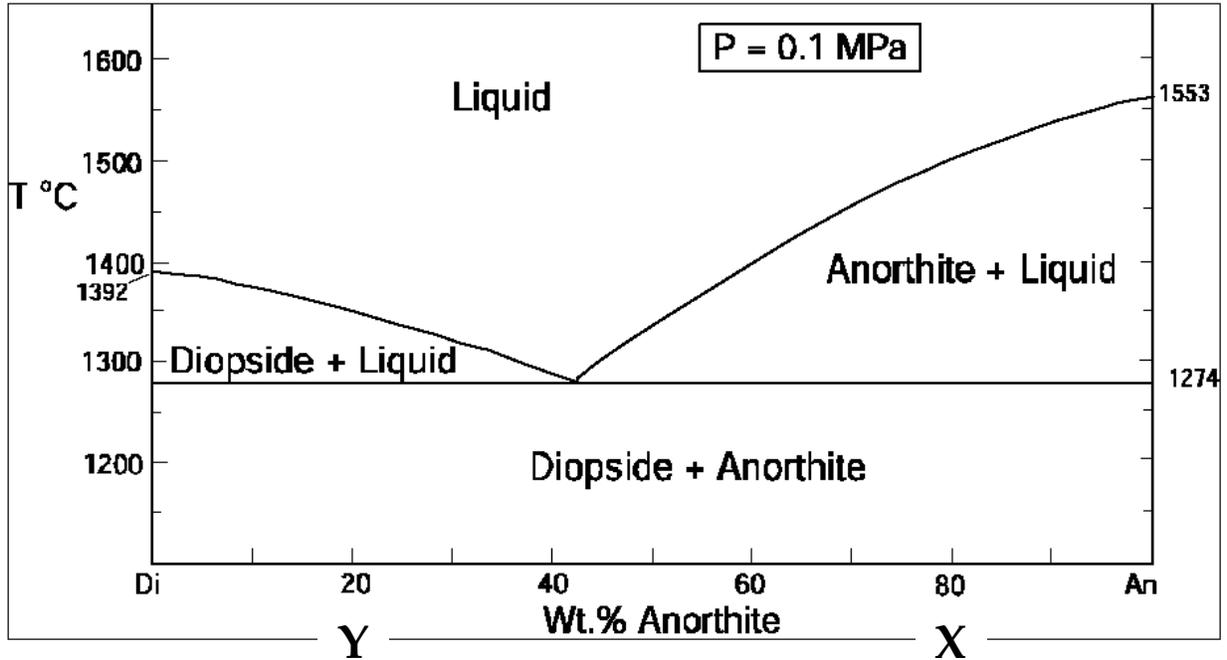


Names: \_\_\_\_\_

## Binary Eutectic Exercises

Consider the system Di-An:



1. Consider a bulk composition that consists of 80 wt% An (X). At what temperature will this mixture begin to melt? At what temperature will first crystals form upon cooling?

2. What will the composition of the first melt be upon heating of X? Of Y? What will the first crystals be upon cooling of X? Of Y?

3. For bulk composition X at 1350°, what will the system consist of? Give the phases present, their compositions, and their proportions.

4. Suppose that bulk composition X at  $1200^{\circ}$  is warmed up until it begins to melt, and then more heat is added. What happens? Consider two cases: one in which all the melt is retained in the system (equilibrium melting), and the other where melt is extracted from the system as it is formed (fractional melting).

5. For bulk composition X, over what temperature range can melt and crystals coexist? For pure An, what is the range?

6. For bulk composition X, predict what a series of lavas would look like if a magma chamber containing a liquid of bulk composition X erupted lava flows at  $1600^{\circ}$ ,  $1400^{\circ}$ , and  $1274^{\circ}$ .

7. Formulate 3 or 4 “rules of thumb” for the behavior of binary eutectic systems.