

QUIZ

1. How are the terms compatible and incompatible defined? From your results, which elements behaved compatibly during crystallization of this magma? Which behave incompatibly? Do all of the elements exhibit the same behavior throughout the duration of crystallization? Explain.

2. Precious metals are incompatible elements. How does the concentration of precious metals (gold, silver and platinum) change during magmatic differentiation? What sort of magmas produce the best precious metal deposits? Why?

3. After each step of crystallization, the left over liquids are called “residual liquids.” What does that mean? The other kind of liquid is a “primitive liquid.” Is the parental basaltic magma in this experiment a “primitive liquid?” Explain.

4. What aspects of this magma chamber are realistic? Which are not? Discuss the way the model might be made more realistic.

5. This experiment modeled fractional crystallization. We looked at the effects of removing minerals from a melt in steps. If, instead, our original melt crystallized via equilibrium crystallization, what would have been the result? Describe the minerals that would form, their proportions, and name the rock.

6. You graphed a number of diagrams that we call Harker diagrams. What are Harker diagrams and what can they tell you? In other words, why are they useful? Suppose you studied a bunch of rocks from one area and plotted their compositions on Harker diagrams, and found the data produced smooth curves – what would you conclude. On the other hand, suppose the data did not produce smooth curves - what would you conclude then?

7. Your Harker diagrams involve major elements. Why, or why not, would they be useful for considering minor or trace elements (assuming you had the data)?