Round: 10B

You are in a submersible in the depths of the Atlantic Ocean, excited to study your first hydrothermal vent. The water temperature begins to increase rapidly. You're approaching the vent!

1. What ocean floor feature are you near? (2 pts)

2. The thermometer measuring the water temperature already reads over 300°C. Why is the water still liquid and not vapor? (2 pts)

3. You lower the thermometer to measure the temperature at the interface of the sediment and the crust, and, to your surprise, the temperature decreases as you approach the vent! Why is this? How can you tell? Refer to the data in Figures 1a & 1b below. (4 pts)

Figure 1a: Thermal Vent

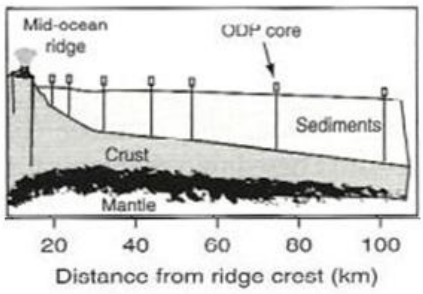
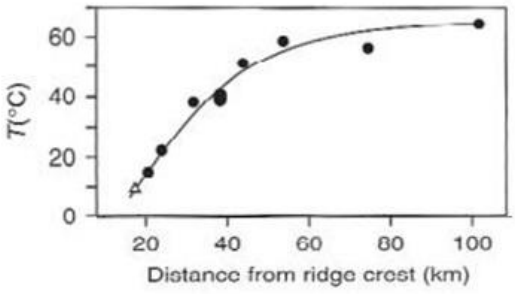


Figure 1b: Temperature Reading



4. You do some quick analyses of magnesium and calcium concentrations as you approach; your data are shown in Figures 2a & 2b on the following page. Are hydrothermal vents sources or sinks for magnesium? For calcium? How do you know? (4 pts)

Figure 2a: Calcium Concentration

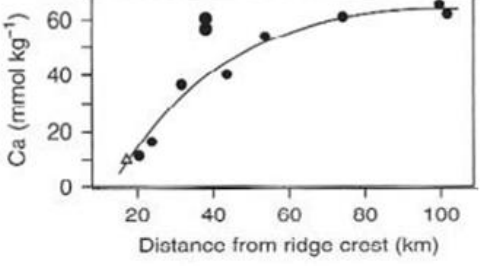


Figure 2b: Calcium Concentration

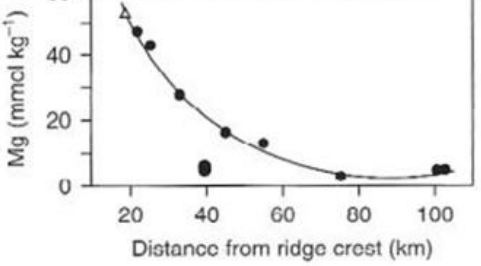
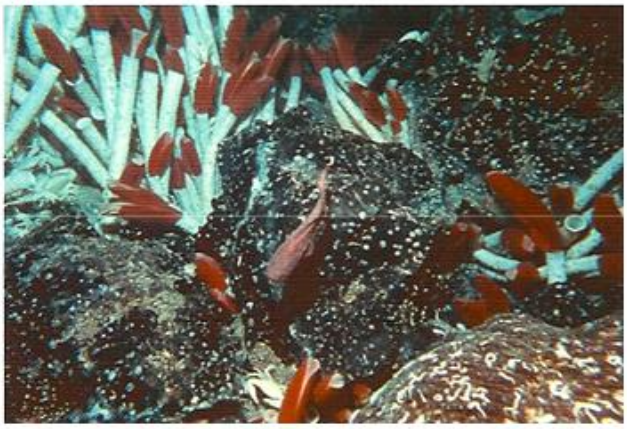


Figure 2b: Magnesium Concentration

5. You look around for signs of life. Luckily your submersible is equipped with a very powerful light. Circle and label only the images below that you would expect to see. (4 pts)

(a)



(b)

(c)

(d)

6. Name two (2) ways in which the animals in this environment differ visibly from the animals you would see in surface water. (4 pts)