

MeriSTEM CHEMISTRY – Reaction Rates

Enthalpy – Practice

Factors that affect rate of reaction QUESTIONS

1. Describe how changing the rate of a reaction would affect how long the reaction lasts.
2. Describe how changing the rate of a reaction affects the amount of products produced.
3. What would you expect to happen to the rate of an aqueous reaction as the reaction proceeds (assuming it stays at the same temperature)? Explain.
4. What might you expect to happen to the rate of a strongly exothermic reaction as it proceeds? Explain.
5. Explain the visual and chemical similarities and differences between the two pictures below (iron powder burning and an old car rusting).



Enthalpy – Practice

Factors that affect rate of reaction SOLUTIONS

1. Describe how changing the rate of a reaction would affect how long the reaction lasts.

Increasing the rate of a reaction speeds the reaction up, meaning it finishes in a shorter time.

2. Describe how changing the rate of a reaction affects the amount of products produced.

If all else is kept the same, speeding a reaction up does not change the final amount of products (only how fast they are made).

3. What would you expect to happen to the rate of an aqueous reaction as the reaction proceeds (assuming it stays at the same temperature)? Explain.

As the reaction proceeds, the reactant are being used up, meaning their concentration is decreasing. Since rate depends on concentration, the rate also decreases as the reaction progresses. Hence the reaction will be fastest at the beginning, and gradually slow down until it finishes.

4. What might you expect to happen to the rate of a strongly exothermic reaction as it proceeds? Explain.

An exothermic reaction gives off heat, increasing the temperature of its surroundings. Since rate depends on temperature, the rate of an exothermic reaction increases as it progresses, since the reaction gets hotter and hotter. This can only be prevented if some kind of heat sink is used to remove the heat as it is produced.

5. Explain the visual and chemical similarities and differences between the two pictures below (iron powder burning and an old car rusting).



Similarities: both are the (exothermic) oxidation of iron.

Differences: on the left the reaction was initiated with a flame and is taking place at a higher temperature. This means it occurs with a higher rate. The iron is also in powder form, meaning it has a high surface area, which increases the rate of reaction even further.

On the right, the identical reaction is occurring at a low temperature and with low surface area, meaning the heat of the exothermic reaction is given off so slowly as to be unnoticeable.