

Reaction Rates : Notes/W.S.-160

Some reactions occur very quickly. An explosion is an example of a fast reaction. Other reactions occur very slowly. The rusting of iron is an example of a slow reaction.

Chemists may want to speed up or slow down reactions.

In general, there are four ways to speed up a reaction.

- 1) Increase the temperature of the reactants.
- 2) Increase the surface area of the reactants.
- 3) Increase the concentration of the reactants.
- 4) Add a catalyst.

A **catalyst** is a substance that speeds up a reaction without being used up. The other three ways to speed up a reaction work by increasing the rate at which reactant particles collide.

Problems.

- 1) Give four ways to speed up a reaction.
- 2) What is a catalyst?
- 3) Explain why 10. grams of paper will burn faster than 10. grams of wood.
- 4) Explain why a strong acid will dissolve zinc faster than a weak acid.
- 5) A solution of hydrogen peroxide will release oxygen slowly. The reaction is $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$. The reaction can be speeded up by adding manganese (IV) oxide. Explain.
- 6) Explain why increasing the temperature of the reactant particles will increase the reaction rate.

Answers: 1) add a catalyst, increase temperature or surface area or concentration of the reactants, 2) It is a substance that speeds up a reaction without being used up., 3) The paper has a bigger surface area., 4) The strong acid has a higher concentration., 5) The manganese (IV) oxide is a catalyst., 7) There will be more collisions between the reactant molecules.