

SCIENCE 1.5

Name: _____

WORKSHEET THREE

RATES AND PARTICLE THEORY

1. The collision theory explains how reactions between particles start. Describe the **THREE** main parts of this theory.

2. Rates of reactions can be increased a number of ways. Decide whether the following would increase or decrease the rate of the reaction of **calcium carbonate** (marble chips) with **hydrochloric acid**. Write **INCREASE** or **DECREASE**.

- (a) Diluting the acid by adding water. _____
- (b) Crushing the marble chips. _____
- (c) Adding more marble chips. _____
- (d) Using the same mass but adding a big chunk of calcium carbonate instead of lots of smaller pieces. _____
- (e) Using 2 mol L⁻¹ hydrochloric acid instead of 1 mol L⁻¹. _____

3. Write a word equation and then a balanced symbol equation for the reaction happening in Q 2.

Calcium carbonate + Hydrochloric acid →

_____ + _____ → _____ + _____ + _____

4. State **FOUR** variables that reaction rates depend on.

5. Increasing the concentration of a reactant can increase the reaction rate. Explain why this happens.

6. Discuss two other ways the reaction rate can be increased and relate these to the collision theory.

7. Below are some terms you should be familiar with. Complete by writing a definition or stating the term defined.

(a) _____ - the theory that relates to how reactions start and how the rates can change.

(b) Concentration- _____

(c) _____ - the amount of reactant exposed to its surroundings, if this is greater it will speed up the reaction.

(d) Temperature- _____

(e) _____ - something that is used to speed up the rate of a reaction but is not used up in the reaction.