2.3 Chemical Reactions: 10-minute Pack

Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A student mixes aqueous silver nitrate with aqueous sodium chloride in separate beakers and then pours them together. Describe two observations the student might make, and name the type of reaction that has occurred.

(3)

---

2 Extended response 6 marks. A student investigates the reaction between sodium thiosulfate solution and dilute hydrochloric acid. The student times how long it takes for the solution to become cloudy at different concentrations of sodium thiosulfate. Describe how the student should change one variable to investigate the effect of concentration, state two things they should keep the same, and explain how the results would show whether a higher concentration increases the rate. In your answer mention how you would present the results.

(6)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 2.3 Chemical Reactions: 10-minute Pack

Question 1

observation 1: a white (or pale) precipitate forms	**M1**
observation 2: the solution may become cloudy and the precipitate sinks or remains suspended	**M1**
name of reaction: precipitation OR insoluble salt forms (cao)	**A1**

Answer: **A white precipitate forms and the mixture becomes cloudy; this is a precipitation reaction.**

Question 2

Level 3 Detailed method and clear reasoning: changes one independent variable correctly, two or more appropriate controls, and explains how results show effect with reference to rate and trends. Describes presentation of results (e.g. table and graph) and draws a supported conclusion.	**5-6**
Level 2 Method sensible with one clear control and one change of concentration; gives a correct statement about expected trend and suggests table or graph but explanation lacks detail or precision.	**3-4**
Level 1 Simple or partial statements such as change concentration and faster with higher concentration, with little or no detail about controls or data presentation.	**1-2**

Indicative content:

- Independent variable: change concentration of sodium thiosulfate by preparing a set of solutions of different known concentrations (eg 1.0, 0.8, 0.6, 0.4, 0.2) while keeping acid concentration the same.
- Controls: keep temperature constant (use a water bath), keep volume of reactants the same, use same total volume and same mixing method, use same cross mark distance to judge cloudiness.
- Method detail: start stopwatch when solutions mixed, stop when cross is obscured, repeat each concentration 3 times and take mean time.
- How results show effect: calculate rate as 1 / time to cloudiness (or change in turbidity per second) and plot rate against concentration; a positive correlation (rate increases with concentration) supports the idea that more particles per volume give more frequent successful collisions.
- Presentation: record raw times in a table, calculate mean times and rates, plot a graph of rate (y) against concentration (x), use the graph to draw conclusions and spot anomalies.

© Revision Library | revisionlibrary.co.uk