

# Download File PDF Reaction Rates Worksheet

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Chemistry 12 Unit 1- Reaction Kinetics  
KEY  
Chemistry 12  
Worksheet 1-1 - Measuring Reaction Rates

1. A chemist wishes to determine the rate of reaction of zinc with hydrochloric acid. The equation for the reaction is:

$$\text{Zn(s)} + 2\text{HCl(aq)} \rightarrow \text{H}_2\text{(g)} + \text{ZnCl}_2\text{(aq)}$$

A piece of zinc is dropped into 1.00 L of 0.100 M HCl and the following data were obtained:

| Time | Mass of Zinc |
|------|--------------|
| 0 s  | 0.016 g      |
| 4 s  | 0.014 g      |
| 8 s  | 0.012 g      |
| 12 s | 0.010 g      |
| 16 s | 0.008 g      |
| 20 s | 0.006 g      |

a) Calculate the Rate of Reaction in grams of Zn consumed per second.

$$\text{Rate} = \frac{\Delta \text{mass}}{\Delta \text{time}} = \frac{0.016 - 0.006 \text{ g}}{20 - 0 \text{ s}} = \frac{0.010 \text{ g}}{20 \text{ s}}$$

Answer:  $5 \times 10^{-4} \text{ g/s}$

b) Calculate the Rate of Reaction in moles of Zn consumed per second.

$$5 \times 10^{-4} \frac{\text{g}}{\text{s}} \times \frac{1 \text{ mol Zn}}{65.4 \text{ g Zn}} = 7.6 \times 10^{-6} \frac{\text{mol Zn}}{\text{s}}$$

Answer:  $8 \times 10^{-6} \text{ mol Zn/s}$

c) Write out the complete ionic equation for the reaction.

$$\text{Zn} + 2\text{H}^+ + 2\text{Cl}^- \rightarrow \text{H}_2\text{(g)} + \text{Zn}^{2+} + 2\text{Cl}^-$$

d) What will happen to the [H<sup>+</sup>] as the reaction proceeds? decrease

e) What will happen to the [Cl<sup>-</sup>] as the reaction proceeds? no change (spectator)

2. When magnesium is reacted with dilute hydrochloric acid (HCl), a reaction occurs in which hydrogen gas and magnesium chloride is formed.

a) Write a balanced formula equation for this reaction.

$$\text{Mg} + 2\text{HCl(aq)} \rightarrow \text{H}_2\text{(g)} + \text{MgCl}_2\text{(aq)}$$

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