

Name:

Chapter 11 Review Quiz

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- ☐ 1. The balanced equation for the complete combustion of ethanol is:
- $\text{C}_2\text{H}_5\text{OH}(\text{l}) + 2\text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l})$.
 - $\text{C}_2\text{H}_5\text{OH}(\text{l}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l})$.
 - $\text{C}_2\text{H}_5\text{OH}(\text{l}) + 3\text{O}_2(\text{g}) \rightarrow 2\text{CO}(\text{g}) + 3\text{H}_2\text{O}(\text{l})$.
 - $2\text{C}_2\text{H}_5\text{OH}(\text{l}) + 3\text{O}_2(\text{g}) \rightarrow 4\text{CO}_2(\text{g}) + 6\text{H}_2(\text{g})$.
- ☐ 2. Enthalpy of combustion is:
- the heat energy released when 1.00 g of fuel is combusted in excess oxygen.
 - the heat energy released when 1.00 mole of fuel is combusted with oxygen in the correct mole ratio.
 - the heat energy released when 1.00 mole of fuel is combusted in excess oxygen.
 - the heat energy released when 1.00 g of fuel is combusted with oxygen in the correct mole ratio.
- ☐ 3. 4.2 g of ethanol is combusted and used to heat 350 mL of water. During the combustion, the temperature of the water raised by 43°C. Calculate the enthalpy of combustion for this reaction.
- 8.28 kJ/mol
 - 62909 kJ/mol
 - 14.98 kJ/mol
 - 690 kJ/mol
- ☐ 4. Which of the following does not contribute to a result significantly lower than the theoretical value during enthalpy of combustion investigations?
- Absorption of heat by equipment including the calorimeter, tripods and gauze mats
 - Loss of heat to the air around the flame
 - Evaporation of water from the container during combustion
 - Incomplete combustion of the fuel during combustion
- ☐ 5. Ethanol has an enthalpy of combustion of -1360 kJ/mol. What is the heat released per gram of ethanol?
- 29.52 kJ/g
 - 29.52 kJ/g
 - 62652 kJ/g
 - 62652 kJ/g
- ☐ 6. 2-pentanol undergoes a dehydration reaction to form the products:
- 1-pentene and water.
 - 2-pentene and water.
 - 1-pentene and hydrogen gas.
 - 2-pentene and hydrogen gas.
- ☐ 7. 2-propanol reacts with hydrogen bromide (HBr) to form the products:
- 1-bromopropane and hydroxide ions.
 - 1-bromopropane and water.
 - 2-bromopropane and hydroxide ions.
 - 2-bromopropane and water.
- ☐ 8. Alcohols can be oxidised by addition of acidified dichromate ions. These ions are used because:
- they are the only chemical that will oxidise primary, secondary and tertiary alcohols.

- b. they undergo a distinct and observable colour change.
- c. they will cause tertiary alcohols to be oxidised.
- d. they are a chemical that can be used by students in a school laboratory.

▼ 9. When primary alcohols oxidise, they go through two stages of oxidation. The correct sequence of formation of chemicals is:

- a. primary alcohol \rightarrow ketone \rightarrow aldehyde.
- b. primary alcohol \rightarrow ketone \rightarrow carboxylic acid.
- c. primary alcohol \rightarrow carboxylic acid \rightarrow aldehyde.
- d. primary alcohol \rightarrow aldehyde \rightarrow carboxylic acid.

▼ 10. When a primary alcohol oxidises, the intermediate product is not formed for very long, and it almost immediately oxidises to the final product. A method of collecting the intermediate product is:

- a. distilling the intermediate product as it forms so it does not further oxidise to the final product.
- b. adding less acidified dichromate ions to prevent oxidation to the final product.
- c. reducing the final product to reform the intermediate product.
- d. evaporating the final product, leaving behind the intermediate product.

▼ 11. When 2-methyl-3-hexanol is oxidised with acidified dichromate ions, the organic product formed is:

- a. 2-methyl-3-hexanone.
- b. 3-hexanone.
- c. 2-methylhexanal.
- d. 2-methylhexanoic acid.

▼ 12. Ethanol and 2-methyl-2-propanol were added to acidified dichromate ions and heated. What would have been observed?

- a. The ethanol would form ethanoic acid and 2-methyl-2-propanol would not react.
- b. The container with the ethanol would remain orange. The container with the 2-methyl-2-propanol will change colour from orange to green.
- c. The container with the ethanol would change colour from orange to green and ethanoic acid would form. The container with the 2-methyl-2-propanol will stay orange.
- d. The container with the ethanol would change colour from orange to green. The container with the 2-methyl-2-propanol will stay orange.

▼ 13. Halogenated alkanes undergo substitution reactions to form alcohols more easily than non-halogenated alkanes. The reason for this is:

- a. alkanes are unreactive so will not react with water.
- b. halogens are more reactive than hydrogen.
- c. the carbon-halogen bond is harder to break than a carbon-hydrogen bond.
- d. the carbon-halogen bond is easier to break than a carbon-carbon or carbon-hydrogen bond.

▼ 14. The balanced equation for the fermentation of glucose is:

- a. $\text{C}_6\text{H}_{12}\text{O}_6(\text{aq}) \rightarrow 2\text{C}_2\text{H}_5\text{OH}(\text{aq}) + 2\text{CO}_2(\text{g})$.
- b. $\text{C}_{12}\text{H}_{24}\text{O}_{12}(\text{aq}) \rightarrow 4\text{C}_2\text{H}_5\text{OH}(\text{aq}) + 4\text{CO}_2(\text{g})$.
- c. $\text{C}_6\text{H}_{12}\text{O}_6(\text{aq}) \rightarrow 2\text{C}_2\text{H}_6\text{OH}(\text{aq}) + 2\text{CO}_2(\text{g})$.
- d. $2\text{C}_6\text{H}_{12}\text{O}_6(\text{aq}) \rightarrow 3\text{C}_2\text{H}_5\text{OH}(\text{aq}) + 3\text{CO}_2(\text{g})$.

▼ 15. The difference between monosaccharides and disaccharides is:

- a. monosaccharides all have 6 carbons, and disaccharides all have 12 carbons.
- b. monosaccharides have a ring structure, and disaccharides have a straight chain structure.
- c. monosaccharides have a single ring structure, and disaccharides have a double ring structure.
- d. monosaccharides have a straight chain structure, disaccharides form a large single ring

structure.

- ▼ 16. Which of the following describes the ideal conditions required for fermentation?
- Aerobic conditions, low temperatures, slightly acidic, dilute solution
 - Anaerobic conditions, low temperatures, slightly basic, dilute solution
 - Anaerobic conditions, high temperatures, slightly acidic, dilute solution
 - Anaerobic conditions, low temperatures, slightly acidic, dilute solution
- ▼ 17. The reason low temperatures are required for fermentation is:
- the ethanol develops an unpleasant flavour when fermented at higher temperatures.
 - the enzymes will denature at high temperatures, stopping fermentation.
 - the ethanol is converted to ethanoic acid (vinegar) at high temperatures.
 - fermentation proceeds at an uncontrolled rate at high temperatures.
- ▼ 18. Bioethanol is:
- produced from waste oils and food.
 - produced as a by-product of crude oil waste products.
 - used as a fuel in its pure form.
 - used as an additive to petrol.
- ▼ 19. Ethanol is considered a more environmentally friendly fuel than petrol produced from crude oil because:
- it produces around 10% of the carbon dioxide that petrol does when combusted.
 - the carbon dioxide released during combustion does not result in a net addition of carbon dioxide to the atmosphere.
 - it produces more energy per mole of fuel combusted than petrol.
 - it has significantly better fuel economy than petrol.
- ▼ 20. Which of the following statements about biodiesel is incorrect?
- Most biodiesel is produced from waste oil and food.
 - Biodiesel is formed from the breakdown of triglycerides.
 - A catalyst is used to speed up the reaction rate in biodiesel production.
 - Vehicles can use 100% biodiesel without engine modification.

