Name:
Score: 0 / 20 points (0%)

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:
a. $C_2H_5OH(l) + 2O_2(g) \rightarrow 2CO_2(g) + 3H_2O(l)$.
b. $C_2H_5OH(l) + 3O_2(g) \rightarrow 2CO_2(g) + 3H_2O(l)$.
c. $C_2H_5OH(l) + 3O_2(g) \rightarrow 2CO(g) + 3H_2O(l)$.
d. $2C_2H_5OH(l) + 3O_2(g) \rightarrow 4CO_2(g) + 6H_2(g)$.

ANSWER: B
Complete combustion produces carbon dioxide and water.
POINTS: 0 / 1
FEEDBACK:
REF: 316

___ 2. Enthalpy of combustion is:
a. the heat energy released when 1.00 g of fuel is combusted in excess oxygen.
b. the heat energy released when 1.00 mole of fuel is combusted with oxygen in the correct mole ratio.
c. the heat energy released when 1.00 mole of fuel is combusted in excess oxygen.
d. the heat energy released when 1.00 g of fuel is combusted with oxygen in the correct mole ratio.

ANSWER: C
Enthalpy of combustion involves 1.00 mole of fuel in excess oxygen.
POINTS: 0 / 1
FEEDBACK:
REF: 317

___ 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.
a. –8.28 kJ/mol
b. –62909 kJ/mol
c. 14.98 kJ/mol
d. –690 kJ/mol

ANSWER: D
Calculations give an answer of –690 kJ/mol.
POINTS: 0 / 1
FEEDBACK:
REF: 317

___ 4. Which of the following does not contribute to a result significantly lower than the theoretical value during enthalpy of combustion investigations?
a. Absorption of heat by equipment including the calorimeter, tripods and gauze mats
b. Loss of heat to the air around the flame
c. Evaporation of water from the container during combustion
d. Incomplete combustion of the fuel during combustion

ANSWER: C
Evaporation of water is unlikely in enthalpy of combustion as temperatures do not usually reach boiling point.
POINTS: 0 / 1
FEEDBACK:
REF: 319

5. Ethanol has an enthalpy of combustion of –1360 kJ/mol. What is the heat released per gram of ethanol?
   a. 29.52 kJ/g
   b. –29.52 kJ/g
   c. 62652 kJ/g
   d. –62652 kJ/g

ANSWER: A
To find heat per gram, use the enthalpy value and the molar mass of the compound.
POINTS: 0 / 1
FEEDBACK:
REF: 320

6. 2-pentanol undergoes a dehydration reaction to form the products:
   a. 1-pentene and water.
   b. 2-pentene and water.
   c. 1-pentene and hydrogen gas.
   d. 2-pentene and hydrogen gas.

ANSWER: A
Dehydration of an alcohol produces an alkene and water.
POINTS: 0 / 1
FEEDBACK:
REF: 322

7. 2-propanol reacts with hydrogen bromide (HBr) to form the products:
   a. 1-bromopropane and hydroxide ions.
   b. 1-bromopropane and water.
   c. 2-bromopropane and hydroxide ions.
   d. 2-bromopropane and water.

ANSWER: D
Addition of a hydrogen halide to an alcohol produces a haloalkane and water.
POINTS: 0 / 1
FEEDBACK:
REF: 323

8. Alcohols can be oxidised by addition of acidified dichromate ions. These ions are used because:
   a. 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.

ANSWER: B
Colour change of reacting dichromate ions show whether a reaction has occurred or not.
POINTS: 0 / 1
FEEDBACK:
REF: 323

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

a. primary alcohol → ketone → aldehyde.

b. primary alcohol → ketone → carboxylic acid.

c. primary alcohol → carboxylic acid→ aldehyde.

d. primary alcohol → aldehyde → carboxylic acid.

ANSWER: D
A primary alcohol oxidises first to an aldehyde, then to a carboxylic acid.
POINTS: 0 / 1
FEEDBACK:
REF: 323

___ 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.

ANSWER: A
Distillation of the aldehyde immediately as it oxidises prevents further exposure to dichromate ions and thus further oxidation.
POINTS: 0 / 1
FEEDBACK:
REF: 324

___ 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.

ANSWER: A
A secondary alcohol oxidises to a ketone.
POINTS: 0 / 1
FEEDBACK:
REF: 324

___ 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.

ANSWER: D
Observations involve things like colour changes. You cannot observe a chemical form. Primary alcohol container changes from orange to green, and the tertiary alcohol container will not change colour.

POINTS: 0 / 1
FEEDBACK:
REF: 325

___ 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.

ANSWER: C
The carbon-halogen bond is easier to break than the carbon-hydrogen bond when the -OH group is substituted.
POINTS: 0 / 1
FEEDBACK:
REF: 323

___ 14. The balanced equation for the fermentation of glucose is:
a. $C_6H_{12}O_6(aq) \rightarrow 2C_2H_5OH(aq) + 2CO_2(g)$.
b. $C_{12}H_{24}O_{12}(aq) \rightarrow 4C_2H_5OH(aq) + 4CO_2(g)$.
c. $C_6H_{12}O_6(aq) \rightarrow 2C_2H_6OH(aq) + 2CO_2(g)$.
d. $2C_6H_{12}O_6(aq) \rightarrow 3C_2H_5OH(aq) + 3CO_2(g)$.

ANSWER: A
Glucose ferments to form ethanol and carbon dioxide.
POINTS: 0 / 1
FEEDBACK:
REF: 329

___ 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.

ANSWER: C
It is the single/double/multiple ring structure that defines the type of sugar.
POINTS: 0 / 1
FEEDBACK:
REF: 330

___ 16. Which of the following describes the ideal conditions required for fermentation?
a. Aerobic conditions, low temperatures, slightly acidic, dilute solution
b. Anaerobic conditions, low temperatures, slightly basic, dilute solution
c. Anaerobic conditions, high temperatures, slightly acidic, dilute solution
d. Anaerobic conditions, low temperatures, slightly acidic, dilute solution

ANSWER: D
Required conditions are anaerobic, dilute, acidic and low temperatures.
POINTS: 0 / 1
FEEDBACK:
REF: 330

REF: 330

___ 17. The reason low temperatures are required for fermentation is:
a. the ethanol develops an unpleasant flavour when fermented at higher temperatures.
b. the enzymes will denature at high temperatures, stopping fermentation.
c. the ethanol is converted to ethanoic acid (vinegar) at high temperatures.
d. fermentation proceeds at an uncontrolled rate at high temperatures.

ANSWER: B
Enzymes (from yeast) are temperature dependent so require low temperatures.
POINTS: 0 / 1
FEEDBACK:
REF: 330

___ 18. Bioethanol is:
a. produced from waste oils and food.
b. produced as a by-product of crude oil waste products.
c. used as a fuel in its pure form.
d. used as an additive to petrol.

ANSWER: D
Bioethanol is added to petrol in levels of around 10%.
POINTS: 0 / 1
FEEDBACK:
REF: 334

___ 19. Ethanol is considered a more environmentally friendly fuel than petrol produced from crude oil because:
a. it produces around 10% of the carbon dioxide that petrol does when combusted.
b. the carbon dioxide released during combustion does not result in a net addition of carbon dioxide to the atmosphere.
c. it produces more energy per mole of fuel combusted than petrol.
d. it has significantly better fuel economy than petrol.

ANSWER: B
As the carbon dioxide is only recently removed from the atmosphere through crop growth, the return through combustion does not add extra carbon dioxide like fossil fuels do.
POINTS: 0 / 1
FEEDBACK:
REF: 334

___ 20. Which of the following statements about biodiesel is incorrect?
a. Most biodiesel is produced from waste oil and food.
b. Biodiesel is formed from the breakdown of triglycerides.
c. A catalyst is used to speed up the reaction rate in biodiesel production.
d. Vehicles can use 100% biodiesel without engine modification.

ANSWER: D
Vehicle engines need modification to use 100% biodiesel.
POINTS: 0 / 1
FEEDBACK:
REF: 335

Retake