Combustion reactions chem worksheet 10- 5

CHEM 101 Worksheet, Chapter 6: Thermochemistry

Multiple choice questions 1-10 (page 1): circle the correct answer(A-E)
Show your work questions 11-13 (pages 2-3): give the complete answer in the space provided
R = 8.314 J/(mol.K) = 0.08206 L.atm(mol.K) 1 cal = 4.184 J 0 °C = 273 K

1. Calculate the heat effect q (in kJ) when 112 g of iron (Fe(s)) is heated from 20 °C to 300 °C. The specific heat of Fe(s) = 0.48 J/g.K
A. –34.9 kJ kJ B. +34.9 kJ C. –15.0 kJ D. –270 J E. +15.0 kJ

2. The dissolution reaction for ammonium chloride: $NH_4Cl(s) \rightarrow NH_4^+(aq) + Cl^-(aq)$ is endothermic. When ammonium chloride is dissolved in water in an insulated (adiabatic) system, the temperature will:
A. increase B. decrease C. stay the same

3. Consider the reaction: $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$. $\Delta H_{rxn} = +178$ kJ What is the enthalpy change when 20.0 kg CaO is formed?
A. $+6.36 \times 10^4$ kJ B. -6.36×10^4 kJ C. $+6.36 \times 10^4$ J D. 63.6 kJ E. +178 kJ

4. Consider the reaction: $2NO + O_2 \rightarrow 2NO_2$ $\Delta H_{rxn} = -114.6$ kJ As always, the ΔH is "for the reaction as written"! Calculate the enthalpy change ΔH, when 12.6 g NO_2 is produced.
A. –31.4 kJ B. +31.4 kJ C. –15.7 kJ D. +15.7 kJ E. none of these

5. How much heat is associated with the reaction that produces 256.1 g of ammonia, NH_3?
$N_2(g) + 3\,H_2(g) \rightarrow 2\,NH_3(g)$ $\Delta H°_{rxn} = -92.45$ kJ
A. 92.45 kJ of heat is released B. 696.1 kJ of heat is released C. 184.9 kJ of heat is absorbed
D. 184.9 kJ of heat is released E. 92 kJ of heat is released

6. Which <u>two</u> of the following are <u>not</u> formation reactions?
1. $\frac{1}{2}N_2(g) + 1\frac{1}{2}H_2(g) \rightarrow NH_3(g)$ 2. $C(s) + O_2(g) \rightarrow CO_2(g)$ 3. $2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$
4. $2Fe(s) + 1\frac{1}{2}O_2(g) \rightarrow Fe_2O_3(s)$ 5. $\frac{1}{2}H_2(g) + \frac{1}{2}I_2(g) \rightarrow HI(g)$
A. 1 and 2 B . 3 and 4 C. 2 and 3 D. 4 and 5 E. 3 and 5

7. Consider the thermochemical reaction equation: $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$ $\Delta H = -198$ kJ
What is the enthalpy change for the reaction: $CO_2(g) \rightarrow CO(g) + \frac{1}{2}O_2(g)$
A. +198 kJ B. –99 kJ C. +99 kJ D. +396 kJ E. –198 kJ

8. Calculate the enthalpy change for the reaction: $2KClO_3 \rightarrow 2\,KCl + O_2(g)$
Standard enthalpy of formation values: $\Delta H_f°(KClO_3) = -389$ kJ/mol $\Delta H_f°(KCl) = -436$ kJ/mol
A. –94 kJ B. –47 kJ C. +94 kJ D. + 47 kJ
E. Cannot be calculated because $\Delta H_f°(O_2(g))$ is not given

9. Given the following two thermochemical equations:
1. $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$ $\Delta H = -572$ kJ
2. $H_2(g) + O_2(g) \rightarrow H_2O_2(l)$ $\Delta H = -188$ kJ
What is the enthalpy change for the reaction: $2H_2O_2(l) \rightarrow 2H_2O(l) + O_2(g)$?
A. –98 kJ B. +98 kJ C. +196 kJ D. –196 kJ E. –668 kJ

10. Which of the following statements is correct for a combustion reaction in an adiabatic "bomb" calorimeter?
A. the pressure is constant B. the temperature is constant C the volume is constant
D. the calorimeter constant's C units are J/g.K E. $\Delta T(K) = \Delta T(°C) + 273.15$

Upon combustion, a compound containing only carbon and hydrogen produces 1.83 g CO_2 and 0.901 g H_2O. Find the empirical formula of the compound.

$C_{0.0416}H_{0.100} \longrightarrow C_1H_{2.4}$
0.0416 0.0416

$C_1H_{2.4} \times 5 \longrightarrow C_5H_{12}$

The correct empirical formula is C_5H_{12}

$$0.0416 \text{ mol } CO_2 \times \frac{1 \text{ mol C}}{1 \text{ mol } CO_2} = 0.0416 \text{ mol C}$$

$$0.0500 \text{ mol } H_2O \times \frac{2 \text{ mol H}}{1 \text{ mol } H_2O} = 0.100 \text{ mol H}$$

No other elements besides C and H, so proceed to next step.

$C_{0.0416}H_{0.100}$

Unit 2.1
Worksheet 6.2
Chemical Reaction Types
Chemistry pp. 277-279, 284-286

Name _____
Period ____

<u>Identify each chemical reaction as a synthesis, combination, decomposition, single replacement, double replacement, or combustion reaction.</u>

1. $2KClO_3 + \Delta \rightarrow 2KCl_3$ **D**
2. $Al_2(SO_4)_3 + BaCl_2(aq) \rightarrow AlCl_3(aq) + BaSO_4$ **DR**
3. $2C_2H_6 + 5O_2 \rightarrow 4CO_2 + 2H_2O$ **C**
4. $Hg + AgNO_3 \rightarrow Hg(NO_3)_2 + Ag$ **SR**
5. $Ba(NO_3)_2 + (NH_4)_3PO_4 \rightarrow Ba_3(PO_4)_2 + (NH_4)_2NO_3$ **DR**
6. $Hg_2Cl_2(s) \rightarrow HgCl_2 + Hg$ **D**
7. $2Br + I_2 \rightarrow 2BrI$ **S**
8. $2Al + 3Cu(NO_3) \rightarrow Al_2(NO_3)_3 + 3Cu$ **SR**
9. $2PbO_2 \rightarrow 2PbO + O_2$ **D**
10. $2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$ **C**

<u>Complete the chemical equations for the following SYNTHESIS (COMBINATION) reactions.</u>

11. $Hg + O_2 \rightarrow$ **HgO**
12. $Ca + S \rightarrow$ **CaS**
13. $Na + Cl_2 \rightarrow$ **$NaCl$**
14. $Na + Cl_2 \rightarrow$ **$NaCl$**
15. $Al + O_2 \rightarrow$ **Al_2O_3**

<u>Use the activity series of metals to complete the following SINGLE REPLACEMENT reactions. Write "NR" if there is no reaction.</u>

16. $Zn(s) + AgNO_3 \rightarrow$ **$Ag + Zn(NO_3)_2$**
17. $Au(s) + HCl \rightarrow$ **NR**
18. $Al(s) + H_2SO_4 \rightarrow$ **$H_2 + Al_2(SO_4)_3$**
19. $CuI_2(s) + H_2O \rightarrow$ **NR**
20. $Al(s) + CaCO_3 \rightarrow$ **$Ca + Al_2(CO_3)_3$**

A Level Chemistry
Lesson Element

Worksheet answers for balancing of equations

Balance the following equations.

(1) $C_2H_6 + O_2 \dashrightarrow CO_2 + H_2O$ (Complete combustion)

$C_2H_6 + 5O_2 \dashrightarrow 3CO_2 + 4H_2O$

(2) $C_2H_6 + O_2 \dashrightarrow CO + H_2O$ (Incomplete Combustion)

$2C_2H_6 + 7O_2 \dashrightarrow 6CO + 8H_2O$

(3) $Mg + O_2 \dashrightarrow MgO$

$2Mg + O_2 \dashrightarrow 2MgO$

(4) $Mg + H_2O \dashrightarrow MgO + H_2$

$Mg + H_2O \dashrightarrow MgO + H_2$

(5)$Mg + H_2O \dashrightarrow Mg(OH)_2 + H_2$

$Mg + 2\,H_2O \dashrightarrow Mg(OH)_2 + H_2$

(6) $CaCO_3 \dashrightarrow CaO + CO_2$

$CaCO_3 \dashrightarrow CaO + CO_2$

(7) $Sr(NO_3)_2 \dashrightarrow SrO + NO_2 + O_2$

$2Sr(NO_3)_2 \dashrightarrow 2\,SrO + 4\,NO_2 + O_2$

(8) Balance the following equations for the complete and incomplete combustion of the following : C_6H_{12} C_6H_{14} $C_{10}H_{12}$

$C_6H_{12} + 9O_2 \dashrightarrow 6CO_2 + 6\,H_2O$

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Quiz & Worksheet - Types of Combustion Reactions

1. What must be present in order for combustion to occur?

- oxygen
- a catalyst
- carbon dioxide
- water

2. What is a characteristic of slow combustion reactions?

- They take place at low temperatures.
- They are explosive.
- They only occur inside the body.
- They take place at only high temperatures.

3. Cellular respiration is an example of which type of reaction?

- slow combustion
- spontaneous combustion
- explosive combustion
- single replacement

10 best chemical reactions. Combustion reactions chem worksheet 10-5 answer key. What is a chemical reaction worksheet. What is the chemical reaction class 10. 10 examples of chemical reactions. 10 examples of combustion reaction. Combustion reactions chem worksheet 10-5.

As you have learned, there is not always a straightforward way to balance a reaction. We tend to just go back and forth, balancing elements on the left and the right, until it works. Combustion reactions are easier! Balance the elements in the following order: carbon, hydrogen then oxygen. Take pentane: C5H12 + O2 -> CO2 + H2O Step 1 balance carbon: you see 5 carbons on the left so you know it will produce 5 CO2. C5H12 + O2 -> 5 CO2 + H2O Step 2 balance hydrogen: you see 12 hydrogens on the left so you know it will produce 6 H2O. C5H12 + O2 -> 5 CO2 + 6 H2O Step 3 balance oxygen: you see 10+6 or 16 oxygens on the right so you know it will require 8 O2. C5H12 + 8 O2 -> 5 CO2 + 6 H2O Wow! It is balanced! Actually, it doesn't always work out that easily. Sometimes you get an odd number of oxygens on the right which leads to a fraction in front of O2. You then have to multiply all of your coefficients by 2. (Vocabulary: The numbers subscripted we have been calling subscripts. These are the formulas of the molecules. The numbers in front of the formulas (8, 5 & 2), are called coefficients. These are the numbers we determine when balancing equations.) Your steps are: 1) balance carbon 2) balance hydrogen 3) balance oxygen 4) Multiply by 2 if you have a fraction. Lets try a harder problem, hexane: C6H14 + O2 -> CO2 + H2O Step 1 balance carbon: you see 6 carbons on the left so you know it will produce 6 CO2. C6H14 + O2 -> 6 CO2 + H2O Step 2 balance hydrogen: you see 14 hydrogens on the left so you know it will produce 7 H2O. C6H14 + O2 -> 6 CO2 + 7 H2O (6x2=12 oxygens) (7x1=7 oxygens) Step 3 balance oxygen: you see 12+7 or 19 oxygens on the right so you know it will require 19/2 or eight and a half O2. C6H14 + 19/2 O2 -> 6 CO2 + 7 H2O Step 4 To get rid of the fraction, we multiply all the coefficients by 2. 2 C6H14 + 19 O2 -> 12 CO2 + 14 H2O Ta da!! Wow, it sure seems like a lot of work but it is really easy. Try your hand at it at Dr Wong's website. We use cookies to improve security, personalize the user experience, enhance our marketing activities (including cooperating with our marketing partners) and for other business use. Click “here” to read our Cookie Policy. By clicking “Accept“ you agree to the use of cookies. Read lessRead more Accept 2mg rating ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ Get your online template and fill it in using progressive features. Enjoy smart fillable fields and interactivity. Follow the simple instructions below: Feel all the benefits of submitting and completing legal documents online. Using our platform submitting Combustion Reactions Chem Worksheet Answers only takes a few minutes. We make that possible by giving you access to our feature-rich editor capable of transforming/correcting a document?s original textual content, adding unique boxes, and e-signing. Complete Combustion Reactions Chem Worksheet Answers in several clicks by simply following the recommendations below: Find the document template you require from the collection of legal forms. Click the Get form key to open it and begin editing. Fill out all the requested fields (they will be yellowish). The Signature Wizard will enable you to add your electronic signature after you have finished imputing details. Put the relevant date. Look through the entire document to be certain you?ve completed all the data and no corrections are needed. Press Done and download the resulting document to your gadget. Send the new Combustion Reactions Chem Worksheet Answers in a digital form right after you are done with completing it. Your data is securely protected, because we adhere to the most up-to-date security requirements. Join numerous satisfied users that are already filling in legal forms from their apartments. Get form Experience a faster way to fill out and sign forms on the web. Access the most extensive library of templates available. CxHy Related content chemical reaction between yeast and hydrogen peroxide. 2. Learn how carbon dioxide can be... Learn more The Supplement is an update of key issues addressed in the 1990 IPCC assessment. Six tasks... Learn more Worksheet #6: Combustion Reactions. We will focus on the combustion of hydrocarbons... Learn more Get This Form Now! Use professional pre-built templates to fill in and sign documents online faster. Get access to thousands of forms. C8H18 WS10-5CombustionReactions 2mg 2MgO CH4 CH3OH c12h22o11 CxHy erickson Sucrose C5H11OH pentanol C2H6 octane worksheet Ensure the security of your data and transactions USLegal fulfills industry-leading security and compliance standards. #1 Internet-trusted security seal. Ensures that a website is free of malware attacks. Guarantees that a business meets BBB accreditation standards in the US and Canada. Highest customer reviews on one of the most highly-trusted product review platforms. In order to continue enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation.

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