ΔH Notation and related questions

1. **Numerical response question**

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Left justify your answer in the boxes provided.

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| Consider the following balanced equationCH4(g) + 2O2(g) 🡪 CO2(g) + 2H2O(g) ΔH = -890.5 kJWhen 15.0 g of methane is burned, \_\_\_\_\_\_\_\_\_ kJ of energy will be released.  |

1. **Numerical response question**

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Left justify your answer in the boxes provided.

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| Consider the balanced equation given below.2C8H18(l) + 25O2(g) 🡪 16CO2(g) + 18H2O(g) + 10148.4 kJThe enthalpy change for the combustion of 1.0 g of octane (C8H18(l) ) is \_\_\_\_\_kJ |

1. **Numerical response question**

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Left justify your answer in the boxes provided.

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| NO2(g) is a toxic reddish-brown gas. At high temperatures in automobile engines, nitrogen gas and oxygen gas in the air react to produce nitrogen dioxide gas as follows: N2(g) + 2O2(g) 🡪 2NO2(g)If 104 kJ of energy are absorbed in this endothermic reaction, then \_\_\_\_\_\_\_ g of nitrogen is reacted.  |

1. Use the following reaction to answer the question below.

**2H2O(l) + 571.6 kJ 🡪 2H2(g) + O2(g)**

If one mole of water is formed from its elements, the ΔH is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kJ.

|  |  |
| --- | --- |
| a | -571.6 |
| b | +571.6 |
| c | +285.8 |
| d | -285.8 |

1. Consider the reaction below.

**2NO(g) + O2 (g) 🡪 2 NO2 (g) + 116.2 kJ**

The mass of NO(g) consumed when 50.0 kJ of energy is produced is \_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| a | 25.8 |
| b | 12.9 g |
| c | 20.3 g |
| d | * 1. g
 |

1. Consider the following formation reaction

**Li(s) + ½ H2(g) 🡪 LiH(s) + 90.5 kJ**

The amount of heat necessary to **decompose** 15.9 g of LiH(s) into Li(s) and H2(g) at standard conditions is \_\_\_\_\_\_\_\_.

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| a | 90.5 kJ |
| b | 181 kJ |
| c | 1.44 MJ |
| d | 15.9 kJ |

1. In the combustion of hydrogen, the amount of energy released depends on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| a | Molar mass of hydrogen |
| b | Oxidation number of hydrogen |
| c | Amount of hydrogen used |
| d | Molar enthalpy of formation of hydrogen gas |

1. Consider the reaction of paraffin (C­25H52(s) given below.

**C25H52(s) + 38O2(g) 🡪 25 CO2(g) + 26H2O(g) + energy**

The energy released by paraffin in this reaction is called the molar enthalpy of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |
| --- | --- |
| a | Formation |
| b | Combustion |
| c | Synthesis |
| d | Decomposition  |

1. Consider the equation below.

**2Li(s) + Cl2(g) 🡪 2LiCl(s) + 820 kJ**

The molar heat of formation of LiCl(s) is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 

|  |  |
| --- | --- |
| a | +820 |
| b | +410 |
| c | -410 |
| d | -820 |

1. Consider the following equation:

**2Al2O3(s) 🡪 4Al(s) + 3O2(g) ΔH = 3351.4 kJ**

What change in energy occurs when one mole of aluminum oxide is formed from its elements?

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| --- | --- |
| a | 1675.7 kJ of energy is absorbed |
| b | 1675.7 kJ of energy is released |
| c | 3351.4 kJ of energy is absorbed |
| d | 3351.4 kJ of energy is released  |

1. How much heat is absorbed in the formation of 1.61 g of ethene (C2H4(g)) from its elements?

|  |  |
| --- | --- |
| a | 3.01 kJ |
| b | 32.5 kJ |
| c | 84.2 kJ |
| d | 522 kJ |

1. Consider the following information.

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| SiF4(g) has a molar heat of formation of -1617  |
| SiCl4(l) has a molar heat of formation of -688  |
| SiBr4(l) has a molar heat of formation of -458  |
| SiI4(s) has a molar heat of formation of -190  |

Which Silicon halide is the most stable?

|  |  |
| --- | --- |
| a | SiF4(g) |
| b | SiCl4(l) |
| c | SiBr4(l) |
| d | SiI4(s) |

Solutions:

1. 832

2. 44.

3. 144

4. d

5. a

6. b

7. c

8. b

9. c

10. b

11. a

12. a