Molar Enthalpy Practice **/15**

Make sure to show **ALL** work, sig digs and correct units!

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Calculate the standard molar heat/enthalpy of formation of substance X given the following information

|  |  |
| --- | --- |
| **Substance** | **fH° (kJ/mol)** |
| **M** | –22.5 |
| **Q** | +78.3 |
| **R** | –54.8 |

Given: M + 3Q 🡪 2 R + 2X rxnH° = –562.0 kJ

2. What is the standard molar enthalpy of formation of nitromethane, CH3NO2(l), if its standard molar enthalpy of combustion is –710 kJ/mol? ( The products are carbon dioxide and nitrogen gases, and liquid water.)

3. Isobutane, IUPAC name methylpropane, is a common component of camping stove fuel that performs well at low temperature. Calculate a standard molar enthalpy of formation for methylpropane, CH3CH(CH3)CH3(g), if its standard molar enthalpy of combustion is –2869.0 kJ/mol?

4. If the standard molar enthalpy of combustion of cyclopropane, C3H6(g), is –2091.4 kJ/mol what is its standard molar enthalpy of formation?

5. When dimethyl ether, (CH3)2O(g), burns in a diesel engine the following reaction occurs:

(CH3)2O(g) + 3 O2(g) 🡪 2 CO2(g) + 3 H2O(g) cH = –1086.5 kJ

Calculate a molar enthalpy of formation for dimethyl ether.