**Dougherty Valley HS AP Chemistry**

**WORKSHEET #4**

**Thermochemistry – Practice Quiz**

**Name: Date: Period: Seat #:**

Show all work

$$∆H°= Σ∆H\_{f}^{°} products-Σ∆H\_{f}^{°} reactants $$

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| [1] |
| a) Calculate the amount of heat transferred when 10.00 g of N2O(g) is formed by the following reaction:2N2(g) + O2(g) → 2N2O(g) ΔHrxn = +163.2 kJ18.54 kJ |
| b) Draw an energy diagram for this process. |

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| [2] Predict the value for $∆H\_{f}^{°}$ for the following scenarios and explain why: |
| a) Br2(g) |
| b) Br2(*l*) |
| c) I2(g) |
| d) I2(s) |

[3] Calculate the $∆H\_{rxn}^{°} $ for the following reaction:

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| **C2H4(g) + 3O2(g) → 2CO2(g) + 2H2O(*l*)** | $∆H\_{f}^{°} $C2H4(g) = 226.6 kJ/mol |
|  | $∆H\_{f}^{°}$ CO2(g) = -393.5 kJ/mol |
| $∆H\_{f}^{°} $H2O(*l*) = -285.8 kJ/mol |
| -1584.2 kJ/mol |

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| [4] A 5.00 g sample of liquid water at 25.0°C is heated by the addition of 84.0 J of energy. Determine the final temperature of the water in °C? (The specific heat capacity of the liquid is 4.18 J/g°C). 29.0°C |

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| [6] Propane is a hydrocarbon that is commonly used as a fuel for cooking. Propane’s formula is C3H8. |
| a) Write a balanced equation for the complete combustion of propane gas. |
| b) Calculate the volume of air at 30°C and 1.00 atm that is needed to burn completely 10.0 g of propane. Assume that air is 21.0% O2 by volume. 134 L air |
| c) The heat of combustion ($∆H\_{combustion}^{°}$) is -2,220.1 kJ/mol. Calculate the heat of formation, $∆H\_{f}^{°}$, of propane given that $∆H\_{f}^{°} $of H2O(*l*) is -285.3 kJ/mol and $∆H\_{f}^{°} $of CO2(g) is -393.5 kJ/mol. -101.6 kJ/mol |
| d) Assuming that all of the heat evolved burning 10.0 g propane is transferred to 8.00 kg of water (specific heat = 4.184 J/g°C), calculate the increase in temperature of the water. 15.0°C is ΔT |