**Name: Period: Seat#:**

**Worksheet #1**

**Directions:** Show all work in a way that would earn you credit on the AP Test! This is always the rule! Some answers are provided at the end in italics and underlined. If you need more space, use binder paper and staple to your worksheet.

1. Calculate the standard enthalpy change, ΔHo, for the formation of 1 mol of strontium carbonate (the material that gives the red color in fireworks) from its elements.

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| **Sr (s) + C(graphite) + O2 (g) → SrCO3 (s)** | *–1220 KJ* |
| (1) Sr (s) + O2 (g) → SrO (s) ΔH° = - 592 kJ |
| (2) SrO (s) + CO2 (g) → SrCO3 (s) ΔH° = - 234 kJ |
| (3) C(graphite) + O2 (g) → CO2 (g) ΔH° = - 394 kJ |

1. The combination of coke and steam produces a mixture called coal gas, which can be used as a fuel or as a starting material for other rxns. If we assume coke can be represented by graphite, the eq. for the production of coal gas is

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| **2 C (s) + 2 H2O (g) → CH4 (g) + CO2 (g)** | *+15.3 kJ* |
| (1) C(s) + H2O (g) → CO (g) + H2 (g) ΔH° = 131.3 kJ |
| (2) CO (g) + H2O (g) → CO2 (g) + H2 (g) ΔH° = - 41.2 kJ |
| (3) CH4 (g) + H2O (g) → 3 H2 (g) + CO (g) ΔH° = 206.1 kJ |
|  |

1. One reaction involved in the conversion of iron ore to the metal is

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| **FeO (s) + CO (g) → Fe (s) + CO2 (g)** |  |
| (1) 3 Fe2O3 (s) + CO (g) → 2 Fe3O4 (s) + CO2 (g) ΔH° = -47 kJ |
| (2) Fe2O3 (s) + 3 CO (g) → 2 Fe (s) + 3 CO2 (g) ΔH° = -25 kJ |
| (3) Fe3O4 (s) + CO (g) → 3 FeO (s) + CO2 (g) ΔH° = 19 kJ |
|  | *– 11 kJ* |

1. Find the ΔH for the reaction below, given the following reactions and subsequent ΔH values:.

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| **PCl5 (g) → PCl3 (g) + Cl2 (g)** | *249.8 kJ* |
| P4 (s) + 6Cl2 (g) → 4PCl3 (g) ΔH = −2439 kJ |
| 4PCl5 (g) → P4 (s) + 10Cl2 (g) ΔH = 3438 kJ |

1. Find the ΔH for the reaction below, given the following reactions and subsequent ΔH values:

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| **2CO2 (g) + H2O(g) → C2H2 (g) + O2 (g)** | *235 kJ* |
| C2H2 (g) + 2H2 (g) → C2H6 (g) ΔH = −94.5 kJ |
| H2O(g) → H2 (g) + O2 (g) ΔH = 71.2 kJ |
| C2H6 (g) + O2 (g) → 2CO2 (g) + 3H2O(g) ΔH = −283 kJ |

1. Find the ΔH for the reaction below, given the following reactions and subsequent ΔH values:

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| **N2H4 (*l*) + H2 (g) → 2NH3 (g)** | *−18 kJ* |
| N2H4 (*l*) + CH4O (*l*) → CH2O (g) + N2 (g) + 3H2 (g) ΔH = −37 kJ |
| N2 (g) + 3H2 (g) → 2NH3 (g) ΔH = −46 kJ |
| CH4O(l) → CH2O(g) + H2 (g) ΔH = −65 kJ |

1. Find the ΔH for the reaction below, given the following reactions and subsequent ΔH values:

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| **H2SO4 (*l*) → SO3 (g) + H2O(g)** | *72 kJ* |
| H2S(g) + 2O2 (g) → H2SO4 (*l*) ΔH = −235.5 kJ |
| H2S(g) + 2O2 (g) → SO3 (g) + H2O(*l*) ΔH = −207 kJ |
| H2O(*l*) → H2O(g) ΔH = 44 kJ |

1. Find the ΔH for the reaction below, given the following reactions and subsequent ΔH values:

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| **2C2H4O(*l*) + 2H2O(*l*) → 2C2H6O(*l*) + O2 (g)** | *204.0 kJ* |
| C2H6O(*l*) + 3O2 (g) → 2CO2 (g) + 3H2O(*l*) ΔH = −685.5 kJ |
| C2H4O(*l*) + 5/2 O2 (g) → 2CO2 (g) + 2H2O(*l*) ΔH = −583.5 kJ |