CW: Hess's Law

Name: Period: 1 3

1. Calculate ΔH for the reaction: C2H4 (g) + H2 (g) --> C2H6 (g), from the following Data.

|  |  |
| --- | --- |
| C2H4 (g) + 3 O2 (g) --> 2 CO2 (g) + 2 H2O (l) | ΔH = -1411. kJ |
| C2H6 (g) + 3½ O2 (g) --> 2 CO2 (g) + 3 H2O (l) | ΔH = -1560. kJ |
| H2 (g) + ½ O2 (g) --> H2O (l) | ΔH = -285.8 kJ |
|  |  |

1. Calculate ΔH for the reaction 4 NH3 (g) + 5 O2 (g) --> 4 NO (g) + 6 H2O (g), from the following Data.

|  |  |
| --- | --- |
| N2 (g) + O2 (g) --> 2 NO (g) | ΔH = -180.5 kJ |
| N2 (g) + 3 H2 (g) --> 2 NH3 (g) | ΔH = -91.8 kJ |
| 2 H2 (g) + O2 (g) --> 2 H2O (g) | ΔH = -483.6 kJ |
|  |  |

1. Find ΔH° for the reaction 2H2(g) + 2C(s) + O2(g) --> C2H5OH(l), using the following thermochemical data.

|  |  |
| --- | --- |
| C2H5OH (l) + 2 O2 (g) --> 2 CO2 (g) + 2 H2O (l) | ΔH = -875. kJ |
| C (s) + O2 (g) --> CO2 (g) | ΔH = -394.51 kJ |
| H2 (g) + ½ O2 (g) --> H2O (l) | ΔH = -285.8 kJ |
|  |  |

1. Calculate ΔH for the reaction CH4 (g) + NH3 (g) --> HCN (g) + 3 H2 (g), given:

|  |  |
| --- | --- |
| N2 (g) + 3 H2 (g) --> 2 NH3 (g) | ΔH = -91.8 kJ |
| C (s) + 2 H2 (g) --> CH4 (g) | ΔH = -74.9 kJ |
| H2 (g) + 2 C (s) + N2 (g) --> 2 HCN (g) | ΔH = +270.3 kJ |
|  |  |

1. Calculate ΔH for the reaction 2 Al (s) + 3 Cl2 (g) --> 2 AlCl3 (s) from the data.

|  |  |
| --- | --- |
| 2 Al (s) + 6 HCl (aq) --> 2 AlCl3 (aq) + 3 H2 (g) | ΔH = -1049. kJ |
| HCl (g) --> HCl (aq) | ΔH = -74.8 kJ |
| H2 (g) + Cl2 (g) --> 2 HCl (g) | ΔH = -1845. kJ |
| AlCl3 (s) --> AlCl3 (aq) | ΔH = -323. kJ |