# Heat of Formation Worksheet

**Use a standard enthalpies of formation table to determine the change in enthalpy for each of these reactions.**

**a) NaOH(s) + HCl(g) ----> NaCl(s) + H2O(g)**

**[(-411.0) + (-241.8)] – [(-426.7) + (-92.3)] = -133.8 kJ**

1. **2 CO(g) + O2(g) ---> 2 CO2(g)**

**[2(-393.5)] – [2(-110.5)] = -566 kJ**

1. **CH4(g) + 2 O2(g) ---> CO2(g) + 2 H2O(l)**

**[(-393.5) + 2(-285.8)] – [(-74)] = -891.1 kJ**

1. **2 H2S(g) + 3 O2(g) ---> 2 H2O(l) + 2 SO2(g)**

**[2(-285.8) + 2(-296.1)] – [2(-20.1)] = -1123.6 kJ**

**e) 2 NO(g) + O2(g) ---> 2 NO2(g)**

**[2(+33.9)] – [2(+90.4)] = -113 kJ**

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| --- | --- | --- | --- |
| **Compound** | **Hf (kJ/mol)** | **Compound** | **Hf (kJ/mol)** |
| CH4(g) | **-74.8** | HCl(g) | **-92.3** |
| **CO2(g)** | **-393.5** | H2O(g) | **-241.8** |
| NaCl(s) | -411.0 | SO2(g) | **-296.1** |
| H2O(l) | **-285.8** | **NH4Cl(s)** | **-315.4** |
| H2S(g) | **-20.1** | NO(g) | **+90.4** |
| **H2SO4(l)** | **-811.3** | NO2(g) | **+33.9** |
| **MgSO4(s)** | **-1278.2** | **SnCl4(l)** | **-545.2** |
| **MnO(s)** | **-384.9** | **SnO(s)** | **-286.2** |
| **MnO2(s)** | **-519.7** | **SnO2(s)** | **-580.7** |
| NaCl(s) | **-411.0** | **SO2(g)** | **-296.1** |
| **NaF(s)** | **-569.0** | **SO3(g)** | **-395.2** |
| NaOH(s) | **-426.7** | **ZnO(s)** | **-348.0** |
| **NH3(g)** | **-46.2** | **ZnS(s)** | **-202.9** |