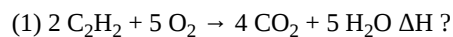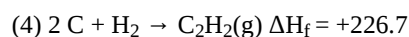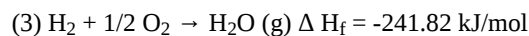# 3.9.5: Lecture Demonstration- Carbide Cannon

Enthalpy of reactions:

Assuming you want about a 1 kJ explosion, how much CaC_2 would you add to a carbide cannon?
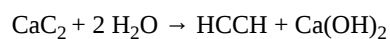
(1) $2 C_2H_2 + 5 O_2 \rightarrow 4 CO_2 + 5 H_2O$ ΔH ?

given

(2) $C + O_2 \rightarrow CO_2$ $\Delta H_f = -393.5$ kJ/mol

(3) $H_2 + 1/2 O_2 \rightarrow H_2O$ (g) $\Delta H_f = -241.82$ kJ/mol

(4) $2 C + H_2 \rightarrow C_2H_2$(g) $\Delta H_f = +226.7$

Calculated enthalpy change for combustion of 2 mol of acetylene, $\Delta H = -2511$ kJ

This is 48.2 kJ/g

for 1 kJ, we need 1 kJ/48.2 kJ/g = 0.02 g of acetylene

$CaC_2 + 2 H_2O \rightarrow HCCH + Ca(OH)_2$

this requires 0.0008 mol of CaC_2, which is 0.05 g.

Do it with a Bangsite Cannon!