Enthalpy of reactions:

Assuming you want about a 1 kJ explosion, how much CaC$_2$ would you add to a carbide cannon?

(1) $2\, \text{C}_2\text{H}_2 + 5\, \text{O}_2 \rightarrow 4\, \text{CO}_2 + 5\, \text{H}_2\text{O} \, \Delta H$ ?

given

(2) $\text{C} + \text{O}_2 \rightarrow \text{CO}_2 \, \Delta H_f = -393.5 \, \text{kJ/mol}$

(3) $\text{H}_2 + \frac{1}{2}\, \text{O}_2 \rightarrow \text{H}_2\text{O} \, (g) \, \Delta H_f = -241.82 \, \text{kJ/mol}$

(4) $2\, \text{C} + \text{H}_2 \rightarrow \text{C}_2\text{H}_2(g) \, \Delta H_f = +226.7$

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

This is 48.2 kJ/g

for 1 kJ, we need $1 \, \text{kJ/48.2 kJ/g} = 0.02 \, \text{g of acetylene}$

CaC$_2$ + 2 H$_2$O → HCCH + Ca(OH)$_2$

this requires 0.0008 mol of CaC$_2$, which is 0.05 g.

Do it with a Bangsite Cannon!

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