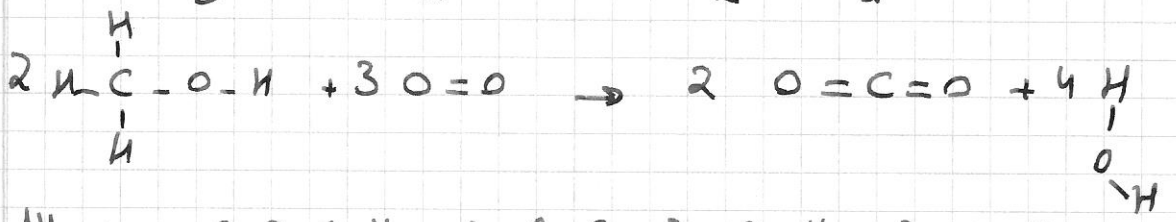
Bonus : intense

1) a)

$$CH_3OH + \frac{3}{2}O_2 \rightarrow CO_2 + 2H_2O$$

x2 (car ne tombe pas juste)

$$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O$$

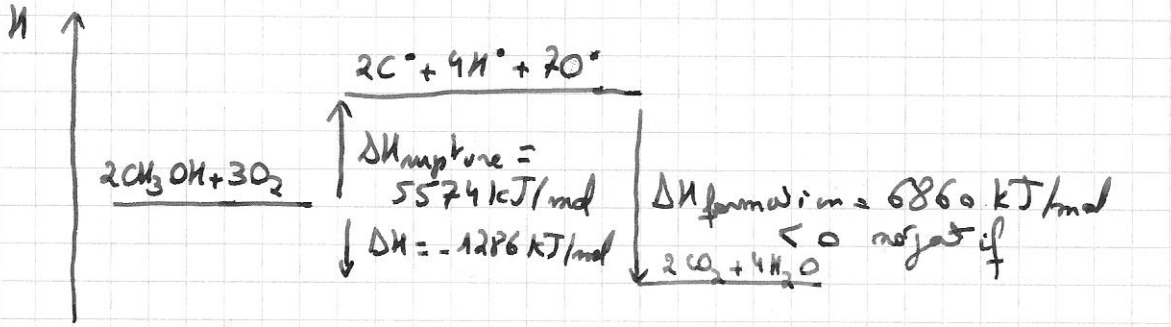


$\Delta H_{rupture} = 2\times 3\times C-H + 2\times C-O + 2\times O-H + 3\times O=O$

$= 6.410 + 2.356 + 2.460 + 3.494 = 5574\ kJ/mol$

$\Delta H_{formation} = 2\times 2\times C=O + 4\times 2\times O-H$

$= 4.795 + 8.460 = 6860\ kJ/mol$



$\Delta H = \underbrace{\Delta H_{rupture}}_{>0} + \underbrace{\Delta H_{formation}}_{<0} = 5574 - 6860 = -1286\ kJ/mol$

2 mol de CH_3OH donnent -1286 kJ

signifie pour une lecture molaire de l'équation ici 2 moles !

$$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O + 1286\ kJ/mol$$

$$2CH_3OH + 3O_2 \rightarrow 2CO_2 + 4H_2O \quad \Delta H = -1286\ kJ/mol$$

2)

$V_{eq} = 2\ L \rightarrow m_{eau} = 2\ kg = 2000\ g$ ($\rho = 1\ g/mL = 1\ kg/L$)

$\theta_i = 20°C$

$\theta_f = 100°C$

$\Delta\theta = 100 - 20 = 80°C$

$$Q = c.m.\Delta\theta = 4{,}18 \cdot 2000 \cdot 80 = 668800\ J$$

(m quantité d'eau)

besoin de 668800 J

2 mol méthanol 1286000 J (×668800 / 1286000)

1,04 mol de méthanol (×668800 / 1286000) 2 mol

$n = 1{,}04$ mol (×M = 32 g/mol)

$m = 33{,}28$ g