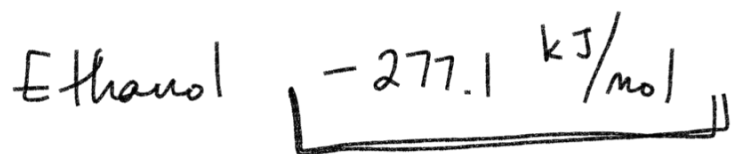


Heat of formation (ΔH) \rightarrow change in enthalpy



$\ominus \rightarrow$ Energy Released
Exergonic Reaction

water 1 mL \rightarrow 1 g
1 L \rightarrow 1 kg

$\oplus \rightarrow$ Energy Absorbed
Endergonic Reaction

750g ethanol

How much energy released?

Molar Mass



C $2 * 12.011$

H $6 * 1.008$

$$750g * \frac{1 \text{ mol}}{46.069g} * \frac{-277.1 \text{ kJ}}{1 \text{ mol}} = \frac{1 * 15.999}{46.069g/mol}$$

$\boxed{-4510 \text{ kJ}}$

We are monitoring a chemical reaction with water as the solvent.

250 mL of water goes from 25°C to 31°C.

How much energy was released during the reaction?

$$[q = mc\Delta T]$$

$$mc(T_f - T_i)$$

↓

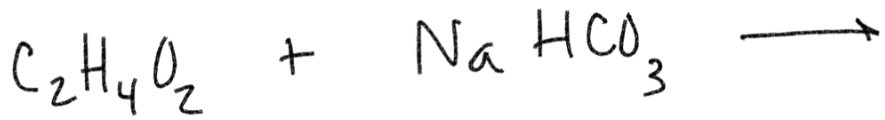
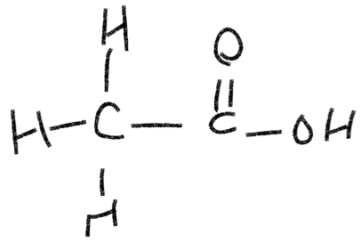
$$(250\text{g})(4.184\text{ J/g}\cdot\text{°C})(31\text{°C} - 25\text{°C})$$

$$\boxed{6276\text{ J} = 6.3\text{ kJ}}$$

c → specific heat of water
4.184 J/g·°C

Vinegar + sodium (baking soda)
95% water bicarbonate

5% acetic acid



Measure solvent → water



50 mL

10 mL

vinegar

Solvent?

50 mL
water

(10 mL) 0.95
9.5 mL