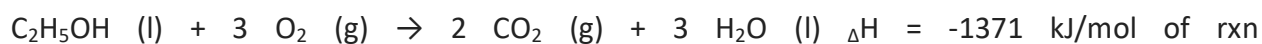


## Task

Ethanol (the alcohol used in "potent potables") undergoes a combustion reaction with the following stoichiometry:



What is the total heat absorbed by the surroundings (in kJ) when 25.0 g of ethanol combusts in the presence of excess oxygen at constant pressure?

## Solution

1) During the combustion reaction, 1 mol of ethanol releases 1371 kJ of heat.

2) Calculate how many moles of ethanol are contained in 25 g (M(Molecular weight of ethanol)= 50 g/mol)

$$n = \frac{m}{M} = \frac{25}{50} = 0,5 \text{ (mol)}$$

3) This means that during the burning of 0,5 mol of ethanol the following amount of heat is released:

$$\Delta Q = -\Delta H \cdot n = 0,5 \cdot 1371 = 685,5 \text{ (kJ)}$$

## Answer

The total heat absorbed by the surroundings is  $\Delta Q = 685,5 \text{ kJ}$  (exothermic reaction)