Answer on Question # 72786 - Chemistry - General Chemistry

A 0.0604−mol sample of a nutrient substance, with a formula weight of 114 g/mol, is burned in a bomb calorimeter containing 1.41×10^2 g H2O. Given that the fuel value is 4.53×10^{-2} in nutritional Cal when the temperature of the water is increased by 2.21°C, calculate the fuel value in kJ.

Solution:

The only required data here is the fuel value in nutritional calories, which is 4.53×10^{-2} Cal. Using the conversion 1 Cal = 4.184 kJ, we can set up a simple conversion:

$$4.53 \times 10^{-2}\ \text{Cal}\ (4.184\ \text{kJ} / 1\ \text{Cal}) = 0.190\ \text{kJ}.$$

Answer: 0.190 kJ.