Answer on Question #77999, Chemistry / General Chemistry

When 1.0 g of a snack cake is combusted in a constant-pressure bomb calorimeter with a heat capacity (including its water) of 10.0 kJ/°C, the temperature of the calorimeter rises by 2.24°C. How many nutritional calories (Calories) are in one serving (28 g) of this snack cake? (1 Calorie = 1000 calories and 1 calorie = 4.184 J)

Solution

$Q = c \times m \times \Delta T$, where c – specific heat, Q – heat released.

$Q = 10 \times 1 \times 2.24 = 22.4$ (kJ) – heat released from the combustion of 1 g.

$Q_{tot} = 22.4 \times 28 = 627.2$ (kJ)

$Q_{cal} = \frac{627200}{4.184} = 149904$ (cal) = **149.9 (Cal)**

Answer

149.9 Calories are in one serving cake.