

Math

Why is the answer rounded to 2×10^3 J/g°C in Module 12, practice problem 10, Exploring Creation with Chemistry?

In this problem, the answer is rounded to 2×10^3 because of significant figure rules. The ΔT for the water and calorimeter is determined by subtracting 24.2 from 25.1:

$$\Delta T = 25.1^\circ \text{C} - 24.2^\circ \text{C}$$

According to Module #1 (p. 28), the rules for addition and subtraction are DIFFERENT than those of multiplication and division. In addition and subtraction, you look at precision (decimal place), NOT number of significant figures. In this problem, both numbers go out to the tenths place, so my answer can only go out to the tenths place. Thus, the answer is 0.9°C .

When that is plugged into the equation for c , it is now multiplying and dividing. When multiplying and dividing, you COUNT SIGNIFICANT FIGURES. Since 0.9°C has only 1 significant figure, the answer can have only 1 significant figure. Thus, the answer is $2,000 \text{ J/g}^\circ\text{C}$, or $2 \times 10^3 \text{ J/g}^\circ\text{C}$.

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