Answer on Question #55342 - Chemistry - General chemistry

Question:

An 80.0-gram sample of a gas was heated from 25 °C to 225 °C. During this process, 346 J of work was done by the system and its internal energy increased by 9055 J. What is the specific heat of the gas?

Solution

The first principle calculations

$$\Delta U = Q - W$$

$$Q = \Delta U + W$$

$$Q = cm\Delta T$$

$$\Delta U + W = cm\Delta T$$

$$c = \frac{\Delta U + W}{m\Delta T}$$

$$c = \frac{9055 + 346}{80 \times (225 - 25)} = 0.588 \ \frac{J}{g \times °C}$$

Answer: $0.588 \ \frac{J}{g \times °C}$