Checking How a Melt Pack Resets

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A display pack contains 20 g of a material that melts at 28 °C. The model requires 50 J to melt each gram at that temperature. After a test the entire pack is liquid. The class cools it before trying to use its melting capacity again.

Reset method	Mass that has become solid before reuse (g)	Temperature at start of next use (°C)
P	20	28
Q	12	28

1 Which recorded value determines how much of each pack can melt again at 28 °C?

(1) The initial pack mass alone

(2) The mass that is already liquid

(3) The measured solid mass before reuse

(4) The starting temperature alone

2 Calculate how much energy each pack can absorb by melting on reuse. Show how the reset record enters the calculation. [1]

Answer and work

The display needs a pack that can absorb 800 J through melting. The class may continue cooling Q at 28 °C so that more of its material becomes solid.

3 Calculate the minimum additional mass that must solidify in Q to reach the requirement. [1]

Answer and work

A third pack has just cooled to 28 °C. A separate phase measurement shows that none of its material has solidified yet.

4 Use the third pack and Q to evaluate the claim that a reading of 28 °C establishes how much energy a pack can absorb by melting on reuse. [1]

Answer and work