1. How much energy must be absorbed by a 150 g sample of ice at 0.0 degrees Celsius that melts and then warms to 25.0 degrees Celsius?

Solution.

$Q_1 = m \cdot \lambda$

$Q_2 = c \cdot m \cdot (t - t_0)$

$E = Q_1 + Q_2 = m \cdot \lambda + c \cdot m \cdot (t - t_0)$

Given: $m = 0.15\ kg,\ t_0 = 0\ °\text{C}, t = 25\ °\text{C}, t - t_0 = 25\ K,\ \lambda = 335\ 000 \frac{J}{kg}, c = 4183 \frac{J}{kg \cdot K}$

Find: $E -$?

$$E = 0.15\ kg \cdot 335\ 000 \frac{J}{kg} + 4183 \frac{J}{kg \cdot K} \cdot 0.15\ kg \cdot 25\ K \approx 66\ kJ$$

Answer:
$E = 66\ kJ$