

Solutions

2.1 B The same intermolecular interactions help explain surface tension and the energy needed to change temperature. Heating changes molecular motion and interactions; it does not normally break the covalent O–H bonds.

2.2 $Q = mc\Delta T = (0.200 \text{ kg}) \times (4,180 \text{ J/(kg K)}) \times (5.0 \text{ K}) = 4,180 \text{ J}$.

2.3 False. Hydrogen bonds between molecules differ from covalent bonds within a water molecule. Polarity alone does not make every substance dissolve well in water.

2.4 cohesion. cohesion means Attraction between molecules of the same substance.

3.1 Ideal rise $Q/(mc) = 5.0 \text{ K}$. The observed rise is lower; container heating or loss can explain it. It does not prove which contribution dominates without measurements.