

Solutions

Each answer shows the steps, then the **result**.

2.1

- the number of possible arrangements of the particles and their energy in a system

2.2

- negative

3.1 B

- A solid producing a gas gives the largest increase in entropy

3.2 C

- A gas has the highest entropy

3.3

(a)

- $\Delta S^\ominus = \sum S(\text{products}) - \sum S(\text{reactants}); = 2(193) - [192 + 3(131)] = 386 - 585 = -199 \text{ J K}^{-1}\text{mol}^{-1}$

(b)

- negative — 4 moles of gas become 2 moles, so the disorder decreases

3.4

- the solid lattice breaks up and its ions/molecules spread out and mix among the water molecules, giving many more arrangements, so the entropy increases