

Chapter 21 Entropy and the Second Law of Thermodynamics

21-2 Change In Entropy

21-02

Question 364

One mole of an ideal monatomic gas is heated quasi-statically at constant volume from 100 K to 105 K. What is the change in entropy of the gas?

- (a) 0.18 J/K.
- (b) 0.26 J/K.
- (c) 0.61 J/K.
- (d) 1.03 J/K.
- (e) 1.39 J/K.

21-02
0.47-52%

Question 365

Suppose that 10 kg of water at 50 degree-C is mixed with an equal amount of water at 10 degree-C. When thermal equilibrium is reached, what is the change in entropy of the mixture? The specific heat of water is 4186 J/kg*K.

- (a) 250 J/K
- (b) 130 J/K
- (c) 246 J/K
- (d) 551 J/K
- (e) 183 J/K

21-02
0.41-53%

Question 366

Five moles of an ideal diatomic gas ($C_p = 7R/2$) is taken through an isovolumetric process. If the final pressure is five times the initial pressure, what is the change in entropy of the gas?

- (a) 234 J/K
- (b) -234 J/K
- (c) -167 J/K
- (d) 167 J/K
- (e) -151 J/K

21-02
0.51-45%

Question 367

Find the change in entropy when 100 g of ice at 0 degree-C is heated slowly to 80 degrees-C. ($C(\text{water}) = 1.0 \text{ cal/g*degree-C}$, $L(f) = 80 \text{ cal/g}$).

- (a) 85 cal/K
- (b) 25 cal/K
- (c) 62 cal/K
- (d) 12 cal/K
- (e) 55 cal/K

21-02

Question 368

The left-hand side of the container shown in Figure 2 contains 5 moles of nitrogen gas, in thermal equilibrium with the right hand side, which contains 3 moles of hydrogen gas. The two sides are separated by a partition, and the container is insulated. After the partition is broken, what is the change in entropy of the system?

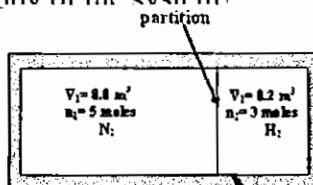


Figure 2

insulation

- (a) 34 J/K
- (b) 58 J/K
- (c) zero
- (d) 12 J/K
- (e) 49 J/K