

Tutorial problems and questions

1. Calculate the increase in enthalpy and entropy for copper when it is heated from 300 to 600 K. The specific heat at constant pressure for copper is described by the empirical relation $C_p = 22.61 + 6.27 \times 10^{-3}T$ J/mol/K and is as shown in Fig. 4.

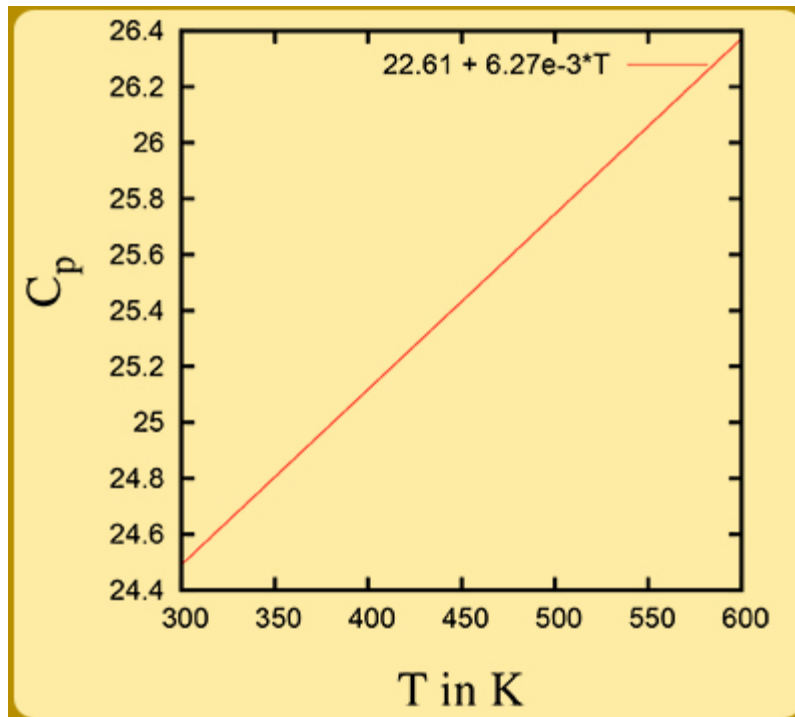


Figure 4: C_p as a function of temperature for copper in the temperature change 300 to 600 K.

Answer

The change in enthalpy, $C_p = 22.61 + 6.27 \times 10^{-3}T$ and $\Delta H = \int_{300}^{600} C_p dT$. Hence,
 $\Delta S = \int_{300}^{600} \frac{C_p}{T} dT$ J/mol and $\Delta H = 7629.45$ J/mol/K.

2. At the equilibrium transformation temperature, the Gibbs free energies of the two phases are

Answer

Equal