9.21) Silver has one conduction electron per atom.

a) Use \( p_{Ag} = 1.05 \times 10^4 \text{ kg/m}^3 \) and \( M_{Ag} = 107.87 \text{ g/mole} \)

Find the density of conduction e-’s.

b) At what temperature is \( A = 1 \) for Ag (in the MB distribution)?

c) At what temperature is \( A = 10^{-3} \)?

\[ p_{Ag} = 1.05 \times 10^4 \text{ kg/m}^3 \left( \frac{\text{kg}}{\text{kg}} \right) = 1.05 \times 10^7 \text{ kg/m}^3 \]

\[ M_{Ag} = 107.87 \frac{\text{g}}{\text{mole}} \left( \frac{1 \text{ mole}}{6.02 \times 10^{23} \text{ atoms}} \right) = 1.79 \times 10^{-22} \frac{\text{g}}{\text{atom}} \]

\[ \Rightarrow n_e^- = \frac{p_{Ag}}{M_{Ag}} = \frac{1.05 \times 10^7}{1.79 \times 10^{-22}} = \boxed{5.86 \times 10^{28} e^-/m^3} \]

\[ \Rightarrow n_{atoms} = n_e^- \quad \text{since there's one conduction e^- per atom.} \]