**Problem 2.2**  A 3-km long AWG-6 metallic wire has a resistance of approximately 6 Ω at 20°C. What material is it made of?

**Solution:**

\[
R = \frac{\ell}{\sigma A}, \quad \text{AWG-6 has a diameter of 4.1 mm.}
\]

\[
\sigma = \frac{\ell}{RA} = \frac{\ell}{R\pi(d/2)^2} = \frac{3 \times 10^3}{6\pi(4.1 \times 10^{-3}/2)^2} = 3.79 \times 10^7 \quad \text{(S/m)},
\]

which, according to Table 2-1, is approximately the value of the conductivity of aluminum.