Thermoelectricity, Atoms to Systems
L1.3 Quiz
Answers

We have seen that the current can be written in terms of voltage and temperature differences in the form $I = G\,\Delta V + G_S\,\Delta T$

1.3a. Suppose we have a material with a conductance function G(E) that is constant with energy: G(E) = G_0. The conductance G is then equal to G_0:

$$G = \int_{-\infty}^{+\infty} dE \left(-\frac{\partial f_0}{\partial E} \right) G(E) = G_0,$$

since $$\int_{-\infty}^{+\infty} dE \left(-\frac{\partial f_0}{\partial E} \right) = 1$$

What is the corresponding coefficient G_S ?

(a) zero

(b) proportional to G_0, but negative in sign

(c) proportional to G_0, and positive in sign

(d) independent of G_0, negative in sign

(e) independent of G_0, positive in sign

1.3b. The magnitude of the Seebeck coefficient S is given by

(a) $|S| = \frac{G_S}{G}$

(b) $|S| = G + G_S$

(c) $|S| = G - G_S$

(d) $|S| = G * G_S$

(e) S is unrelated to G and G_S