4.5. Second Law

4.5a The second law requires that

(a) \( \frac{E_1}{T_1} n_1 + \frac{E_2}{T_2} n_2 \leq 0 \)

(b) \( E_1 + E_2 \geq 0 \)

(c) \( E_1 + E_2 = 0 \)

(d) \( n_1 + n_2 = 0 \)

(e) None of the above

4.5b The current equation we are using

\[
I = \frac{1}{q} \int dE \ G(E) \left( f_1(E) - f_2(E) \right)
\]

(a) complies with energy conservation but not necessarily with the second law

(b) complies with the second law if \( G(E) \) is an increasing function of energy

(c) always complies with the second law

(b) complies with the second law if \( G(E) \) is a decreasing function of energy

(e) None of the above