

**4.5. Second Law**

**4.5a** The second law requires that

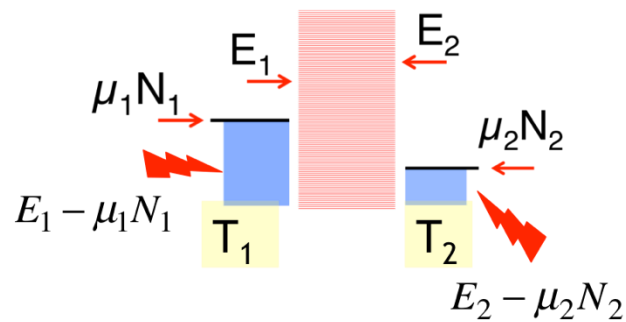
(a)  $\frac{E_1 - \mu_1 N_1}{T_1} + \frac{E_2 - \mu_2 N_2}{T_2} \leq 0$

(b)  $E_1 + E_2 \leq 0$

(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  $I = \frac{1}{q} \int_{-\infty}^{+\infty} dE G(E) (f_1(E) - f_2(E))$

(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