

14. (a) The rate at which solar energy strikes the panel is

$$P = (1.39 \text{ kW/m}^2)(2.60 \text{ m}^2) = 3.61 \text{ kW} .$$

- (b) The rate at which solar photons are absorbed by the panel is

$$R = \frac{P}{E_{\text{ph}}} = \frac{3.61 \times 10^3 \text{ W}}{(6.63 \times 10^{-34} \text{ J}\cdot\text{s})(2.998 \times 10^8 \text{ m/s})/(550 \times 10^{-9} \text{ m})} = 1.00 \times 10^{22}/\text{s} .$$

- (c) The time in question is given by

$$t = \frac{N_A}{R} = \frac{6.02 \times 10^{23}}{1.00 \times 10^{22}/\text{s}} = 60.2 \text{ s} .$$