(8.4) A ^{244}Cm sample is measured in an ion chamber (Fig. 8.9). The voltage drop over a $3*10^{13}$ Ω resistor is measured to be 0.47 V. What is the activity of the sample if all α's emitted in the chamber (2π geometry) are stopped in the gas?

General constants:

$$eV := 1.6021773 \cdot 10^{-19} \cdot joule \qquad MeV := 10^6 \cdot eV \qquad Bq := sec^{-1} \qquad q_e := 1.6021773 \cdot 10^{-19} \cdot coul$$

Given values are:

$$E_\alpha := 5.8 \cdot MeV \qquad\qquad R := 3 \cdot 10^{13} \cdot \Omega \qquad\qquad U := 0.47 \cdot volt$$

$$\eta := 1 \qquad\qquad \psi_{geom} := 0.5 \qquad\text{2-}\pi\text{ geometry}$$

$$I := \frac{U}{R} \qquad\qquad \text{The current giving the measured voltage drop}$$

$$w := 26 \cdot eV \qquad\qquad \text{eV/ion pair in air (from Table 7.1)}$$

$$A := \frac{I \cdot w}{q_e \cdot E_\alpha \cdot \eta \cdot \psi_{geom}} \qquad\qquad A = 0.88 \cdot Bq$$