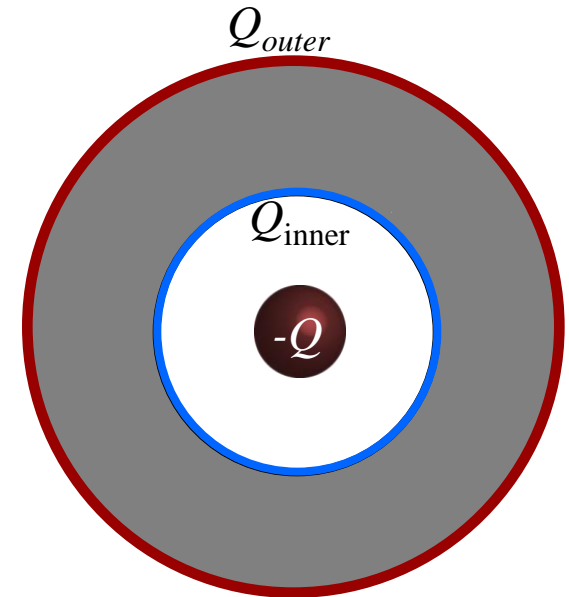


Charge in Cavity of Conductor



A particle with charge $-Q$ is placed in the center of an uncharged conducting hollow sphere. How much charge will be induced on the inner and outer surfaces of the sphere?

- A) inner = $-Q$, outer = $+Q$
- B) inner = $-Q/2$, outer = $+Q/2$
- C) inner = 0, outer = 0
- D) inner = $+Q/2$, outer = $-Q/2$
- E) inner = $+Q$, outer = $-Q$



➤ Gauss' Law:
$$\oint_{surface} \vec{E} \cdot d\vec{A} = \frac{Q_{enc}}{\epsilon_0}$$

Since $E = 0$ in conductor

$$0 = \frac{Q_{enc}}{\epsilon_0}$$
$$0 = -Q + Q_{inner}$$

Since conductor is uncharged

$$Q_{inner} + Q_{outer} = 0$$
$$Q_{outer} = -Q_{inner}$$