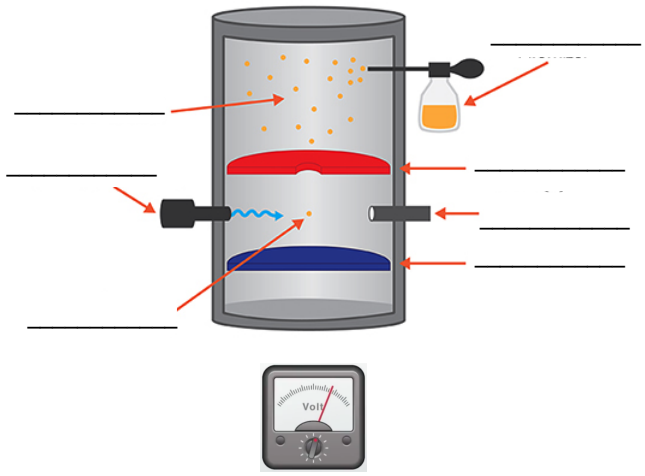
CONCEPT: MILLIKAN OIL DROP EXPERIMENT

- In 1897, J.J Thomson's cathode ray tube experiments led to the discovery of the negative charge of _____.
  - □ Thomson was unable to determine how much negative charge an electron possessed.
  - □ In 1913, _____ and Harvey Fletcher discovered the fundamental charge of an electron.

Experimental Setup

- Millikan and Fletcher used **oil droplets**, _____ plates, gravity and **X-rays** to determine the amount of charge.
  - □ **Atomizer**: The container used to disperse the individual oil droplets.
  - □ **Electric Force:** _____ or _____ forces between particles based on electric charges.

The Apparatus	The Experiment
	**1.** The oil droplets are introduced through the _____. **2.** The X-Ray Source gives a _____ charge to each droplet. **3.** Turning on the power of the charged plates to create an Electric Field. □ If the voltage is _____ than the force of gravity then the droplet _____.  □ If the voltage is _____ than the force of gravity then the droplet _____.  **4.** Through the suspension of the oil droplets the charge of an electron was determined as _____.

EXAMPLE: The fundamental charge of an electron is -1.60×10^{-19} C. If a scientist determines the charge to mass ratio of an electron is -1.76×10^{8} C per gram, what would be the total mass of an electron?

a) 2.82×10^{-11} g b) 9.10×10^{-28} g c) 2.82×10^{27} g d) 1.10×10^{27} g

PRACTICE: Determine the total charge that an oil drop would possess if it holds the same total number of electrons as a sodium atom.

a) -1.60×10^{-19} C b) -1.76×10^{-18} C c) -1.45×10^{-20} C d) -3.55×10^{-19} C