

Properties of Positive Rays

<https://gemini.google.com/app/6c6bb40ec5dd3f84>

Response: Statements **(a)** and **(b)** are true, making the correct set **(a) and (b)**.

- **(a) They are found together with cathode rays: True.** As cathode ray electrons stream from the cathode toward the anode, they collide with neutral gas atoms in the discharge tube, producing positively charged gas ions (positive rays) that travel in the opposite direction toward the perforated cathode.
 - **(b) Formed by loss of electrons from atoms or molecules: True.** High-energy cathode ray electrons knock off electrons from the residual gas atoms or molecules, creating positive gaseous cations ($\text{Atom} \rightarrow \text{Atom}^+ + e^-$).
 - **(c) Mass is independent of the residual gas in the tube: False.** Positive rays consist of ionized gas particles. Since different gases have different atomic/molecular masses, the mass of the positive ray ions depends directly on the nature of the residual gas inside the tube.
 - **(d) Not affected by electric and magnetic fields: False.** Because positive rays consist of charged particles (positive ions), they are deflected by both electric and magnetic fields (deflecting in a direction opposite to cathode rays).
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