

Methods of Electron Emission



Here is the answer key for the 20 fill-in-the-blank questions based on the **Methods of Electron Emission**:

1. **Thermionic emission** occurs when a material is heated to a high temperature.
2. The process of heating a metal to emit electrons is called **thermionic emission**.
3. In thermionic emission, the electrons gain enough energy to overcome the **work function** of the material.
4. Thermionic emission is commonly used in **vacuum tubes** and electron microscopes.
5. **Field emission** occurs when a strong electric field pulls electrons out of a metal.
6. Field emission is also known as **cold emission**.
7. In field emission, a strong **electric field** is applied to the metal to reduce the work function.
8. **Photoelectric emission** occurs when light of sufficient energy strikes a metal surface.
9. The energy of the incoming **photons** must be greater than the work function for photoelectric emission to occur.
10. The photoelectric effect is used in devices like **photovoltaic cells** and photodetectors.
11. **Secondary emission** occurs when high-energy particles collide with a material, ejecting electrons.
12. Secondary emission is used in devices such as electron multipliers and **photomultiplier tubes**.
13. In thermionic emission, the energy required for electron emission is provided by **thermal energy**.
14. Field emission is often used in **field emission displays (FEDs)** and in electron microscopes.
15. In photoelectric emission, the electrons are ejected when struck by **light (photons)**.
16. The process where electrons are emitted due to the impact of other high-energy particles is called **secondary emission**.
17. The process of photoelectric emission is governed by **Einstein's law**, which relates to photon energy.
18. Thermionic emission involves heating the metal until the electrons have enough energy to escape the **surface**.
19. **Field emission** requires that the metal be at room temperature but under a strong electric field.
20. The four types of electron emission are thermionic, field, photoelectric, and **secondary emission**.

These answers correspond to the content provided in the document.