

# Photoemissive cells

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This cell is based on the fact that electrons are emitted from a photo-sensitive surface by the action of light. Figure 1 shows the photoemissive cell. It consists of a photo-sensitive cathode (negative) and collecting anode (positive) enclosed in an evacuated glass envelope.

Cathode is coated with photo-sensitive material such as sodium, potassium or cesium. Anode is straight wire made of nickel or platinum.

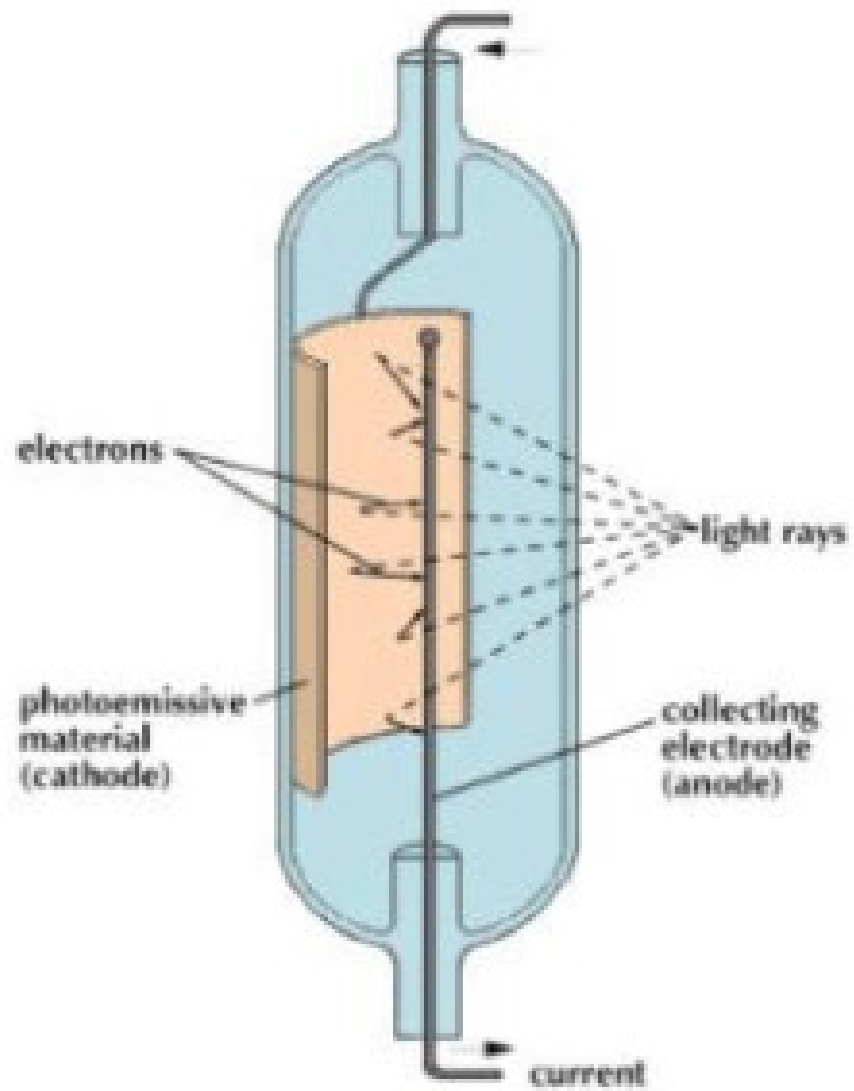


Fig. 1 Photoemissive cell

# WORKING

When light of frequency greater than threshold frequency is made to fall upon the cathode, photo-electrons are emitted from it. These photo-electrons are attracted by the positive anode to constitute current in the external circuit so long as the illumination is maintained.

When small amount of inert gas like argon is added in the glass envelope, it is called as gas-filled photoemissive cell. The presence of gas helps in obtaining more current for a given illumination due to ionisation of the gas.

# TYPES

photoemissive cells are of two types

1. In the **vacuum type cell**, current starts immediately after the light is incident and is proportional to the intensity of incident light. Hence this cell is used for photometry and in televisions.
2. In **gas filled cell**, the current is somewhat larger and is not proportional to the intensity of light. Hence, this type of cell is most suitable in cinematography and in the recording and reproduction of sound.

## **Photoemissive cell Advantages**

1. The emission is instantaneous.
2. The maximum current is proportional to the intensity of radiation.
3. High Sensitivity

## **Photoemissive cell Disadvantages**

1. It generates extremely small current.
2. Direct power supply required for maintaining potential.
3. They are expensive.

# Applications

- controlling temperature of furnace
- Automatic switching on and off of street bulbs
- Reproducing sound in cinematography.