SUBJECT: BASIC ELECTRONICS

Diffusion Current in Semiconductor Diode

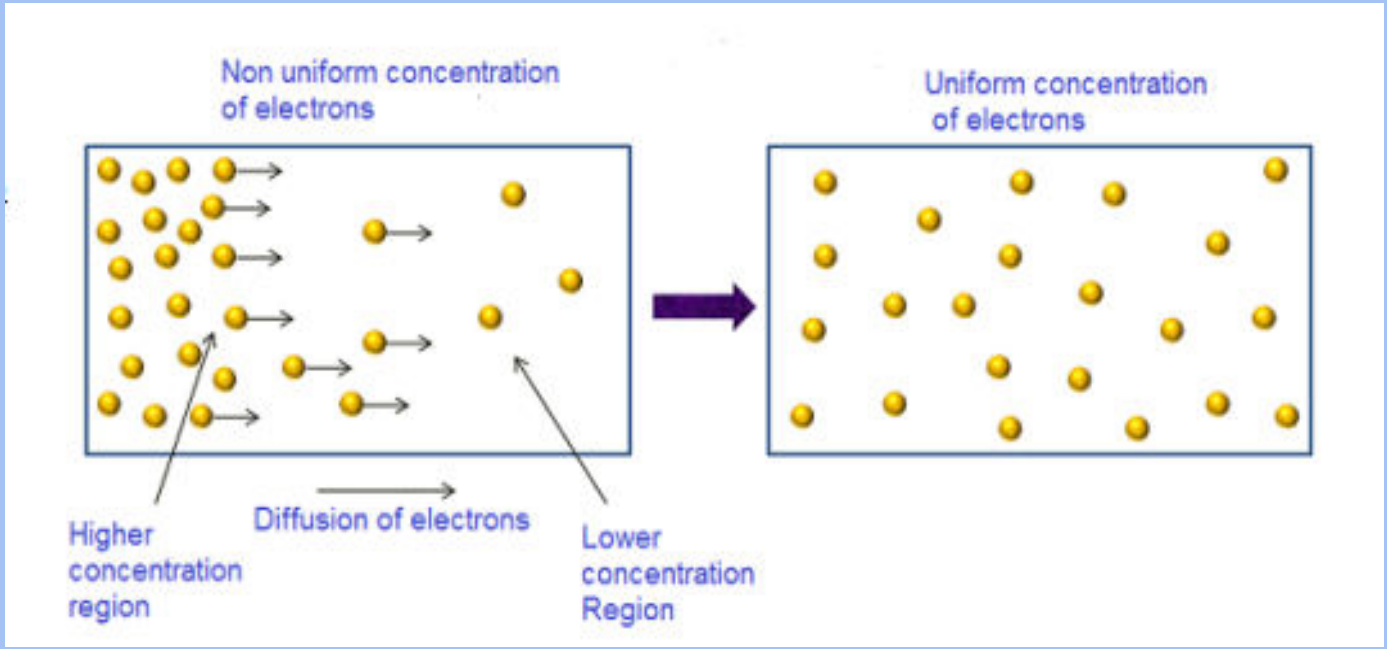
Elementrix Classes

Diffusion Current

- The diffusion current can be defined as the flow of charge carriers within a semiconductor travels from a higher concentration region to a lower concentration region. A higher concentration region is nothing but where the number of electrons present in the semiconductor. Similarly, a lower concentration region is where the less number of electrons present in the semiconductor. The process of diffusion mainly occurs when a semiconductor is doped non-uniformly

- In an N-type semiconductor, when it is doped non-uniformly then a higher concentration region can be formed at the left side whereas the lower concentration region can be formed at the right side.

The electrons in the higher concentration region are more in the semiconductor so they will experience a repulsive force from each other.



- Diffusion current in a semiconductor diode is the flow of charge carriers, such as electrons and holes, driven by their natural tendency to move from regions of higher concentration to regions of lower concentration. This movement occurs across the junction between the p-type and n-type semiconductor materials, creating a diffusion current.

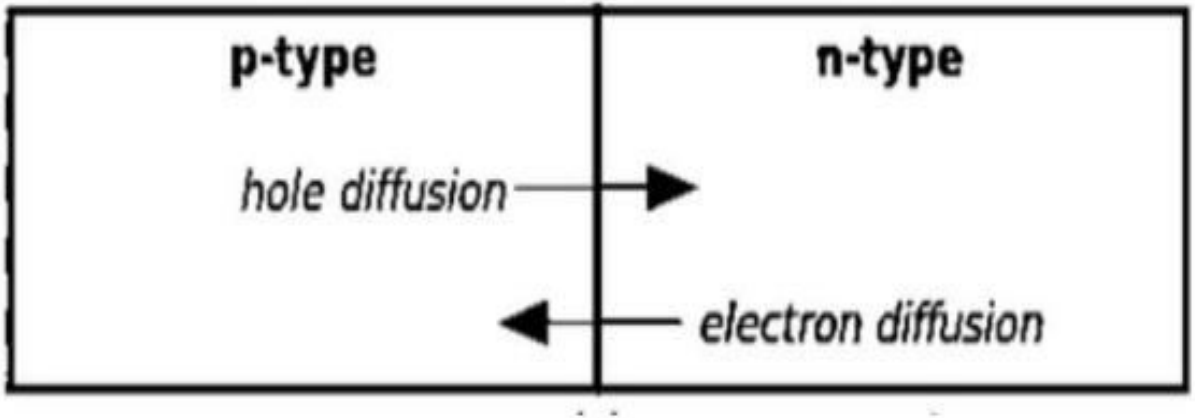


Fig:1.3.2 Diffusion Current

Diffusion Current Equation in Semiconductor Diode :

$$I_{diffusion} = A \times \left(qDp \frac{d_p}{d_x} - qDn \frac{d_n}{d_x} \right)$$

पढ़िए और पढ़ाइये

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