

Indian Institute of Information Technology, Allahabad

ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT

Course Name: Fundamental of Electrical and Electronics

EXPERIMENT NO: 4

Objective:

To study the characteristic curve of a Zener diode.

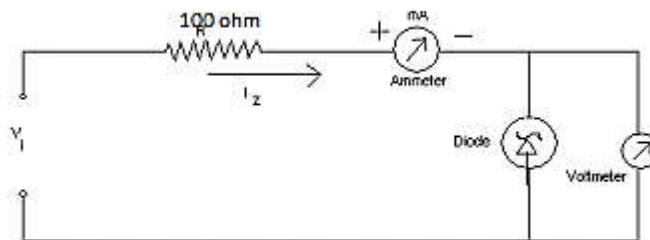
Material required:

Zener Diode- 1, Resistor (100 Ω), Breadboard, Regulated Power supply (0-30 V DC), Digital Ammeter (0-20 mA), Digital voltmeter (0-2V/20V DC), connecting wires.

Theory:

A Zener Diode is constructed for operation in the reverse breakdown region. The relation between I-V is almost linear in this case $V_z = V_{z0} + I_z r_z$, where r_z is the dynamic resistance of the zener at the operating point. V_{z0} is the voltage at which the straight-line approximation of the I-V characteristic intersects the horizontal axis. After reaching a certain voltage, called the breakdown voltage, the current increases widely even for a small change in voltage.

Circuit Diagram:

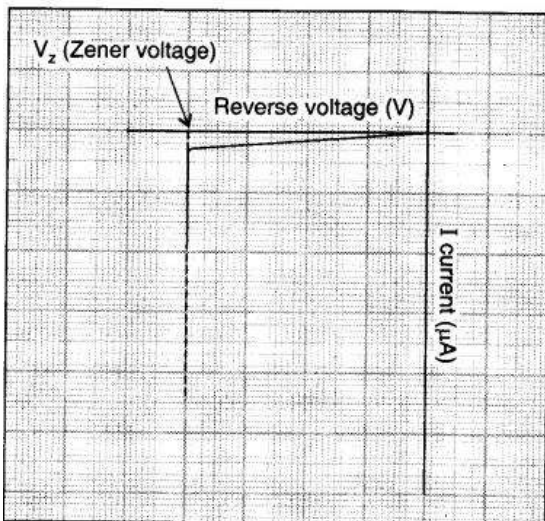


Observations

Measurement of V and I in reverse bias

S.no.	Voltage (in volt)	Current(in mA)

Graph and Calculation:



Result and conclusion:

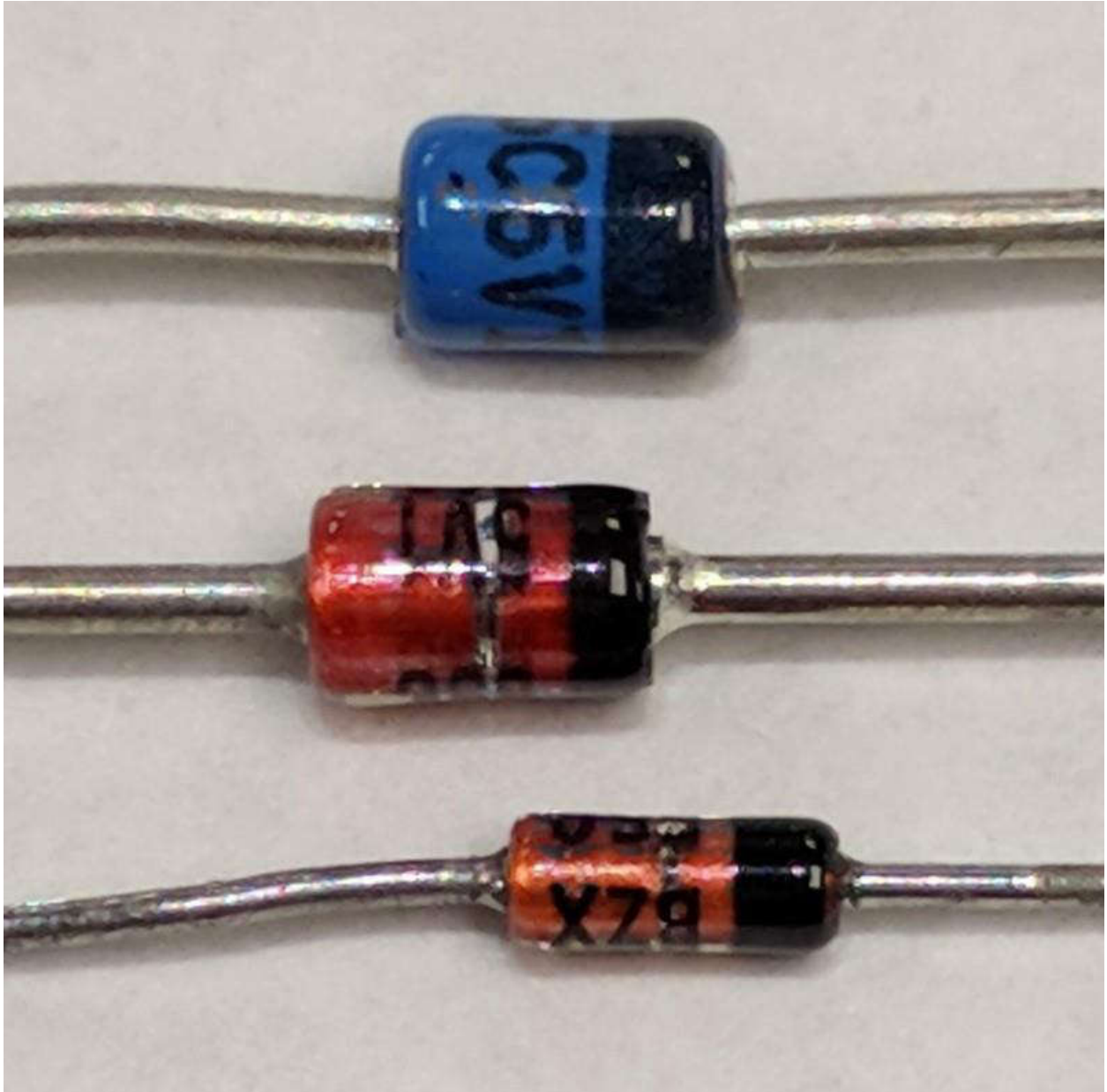
The breakdown voltage is known as zener voltage i.e. =Volt

In reverse-biased, there is no voltage across the resistor and there is no current on the diode when the voltage of the diode is equal or less than 0.

Precautions:

The precautions are quite similar to that taken in a normal diode i.e

1. Excessive flow of current may damage the diode.
2. Current for sufficiently long time may change the characteristics
3. Zener diodes are used in voltage regulation in circuits because even when, a large current flows through, their voltage does not change appreciably.



Zener Diode