7. Plot a graph showing the variation of resistivity with temperature for a metallic conductor.

[Delhi 2008]

8. Draw a graph showing the variation of resistivity with temperature for nichrome.

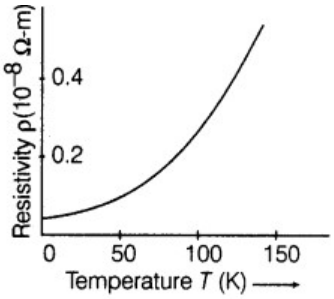
[All India 2013C]

9. A cell of emf 'E' and internal resistance 'r' is connected across a variable load resistor R. Draw the plots of the terminal voltage V versus (i) R and (ii) the current I.

[Delhi 2015]

SOLUTIONS

7. Resistivity of a conductor is defined as the resistance offered by unit length and unit area of cross-section of material of the conductor.



The temperature dependence of resistivity of a metal can be obtained from,
$r = r_0[1 + \alpha(T - T_0)]$
where r and r_0 are the resistivity at temperature T and T_0 respectively and α is called temperature coefficient of resistivity.
The value of α is positive, shows that resistivity increases with increases in temperature.

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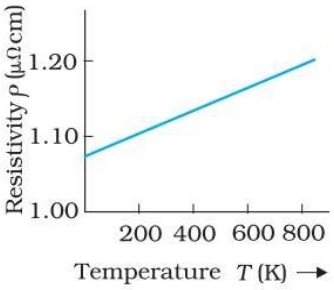
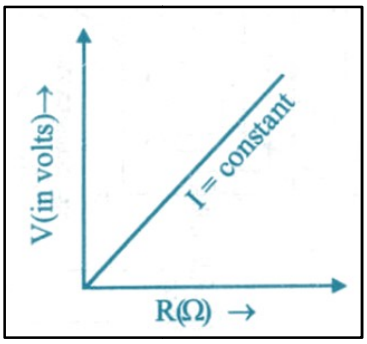
8. Graph of variation of resistivity with temperature for nichrome.

Property of nichrome used to make standard resistance coils: It has low temperature coefficient of resistance.



9. (i) Graph between terminal voltage V and resistance (R)
In the situation when no current is drawn from the cell then
$V = E$ ($\because V = E - Ir$ and $I = 0$)



(ii) Graph between terminal voltage (V) and current (I)