

Question Bank: Determination of Ground term

1. The ground state term symbol for the free Co^{+2} ion is
 - a) ^4F
 - b) ^5F
 - c) ^4P
 - d) ^5D
 - e) ^4D
2. The electronic ground state term for the chromium ion in $[\text{Cr}(\text{CN})_6]^{4-}$ is
 - a) ^3F
 - b) ^3H
 - c) ^3G
 - d) ^5D
3. Find out the ground state term of $3d^5$ configuration of Mn^{+2} .
4. The ground state term symbol for the free ion Fe^{+3} is
 - a) ^5D
 - b) ^6S
 - c) ^6P
 - d) ^6D
 - e) ^4F
5. Derive the ground state term symbol for:
 - i. Ni^{+2}
 - ii. d^{10} ion
 - iii. Zn^{+2}
 - iv. Co^{+3}
 - v. V^{+2}
6. Find the ground term symbol for $\text{Cr}(3d^5 4s^1)$.

7. Identify the ground state term giving reasons for the following set
(calculate L): ^1S , ^3F , ^3P , ^1G , ^1D

8. Give the ground – state Russell – Saunders terms for $3d^5$ and d^8 .

9. Write the Russell – Saunders term symbols for states with the angular momentum quantum numbers (L, S):

a) $\left(0, \frac{5}{2}\right)$

b) $\left(3, \frac{3}{2}\right)$

c) $\left(2, \frac{1}{2}\right)$

d) (1, 1)