

Long Answer Questions

1. Explain the conductivity of metals on the basis of MOT.
2. Derive Bragg's equation
3. What are liquid crystals. How are they classified? Give their applications
4. Write short notes on (i) Graphite (ii) Fullerenes
5. Differentiate crystalline and amorphous solids.  
Chromium has monoatomic body-centered cubic structure. Its cell edge is 300 pm. What is its density? (Molar mass of Cr = 52 g/mol, Avogadro Number  $N = 6.023 \times 10^{23}$ )
6. Define Order and Molecularity of reactions. Give differences between them.
7. What is activation energy. How it may be calculated?  
The rate of reaction triples when temperature changes from 20°C to 50°C. Calculate the energy of activation for such reaction. ( $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$ )
8. What is phase rule. Explain one component system 'water' with phase diagram.
9. On the basis of Electrochemical theory of Corrosion, give the mechanism of the phenomenon.
10. What are fuel cells?

## Chemistry Question Bank

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11. What are  $S_N1$  and  $S_N2$  reactions? Give their mechanisms
12. Write the reaction mechanism of the following reactions  
(i) Beckmann Rearrangement (ii) Hofmann Rearrangement
13. Write short notes on the following  
(i) Conducting Polymers (ii) Organometallic Compounds
14. Mention ion exchange process of softening water. Give the chemical reactions involved.
15. How calorific value can be determined by Bomb's calorimeter. Explain with the help of neat diagram.
16. What is ultimate analysis of coal? How Carbon and hydrogen are estimated by this ~~method~~
17. Write a short note on 'Fingerprint' region
18. What is IR spectroscopy?
19. What do you understand by UV spectroscopy?
20. Describe some important applications of NMR spectroscopy