

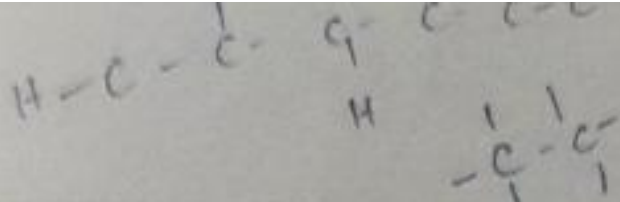
01. Molecular orbitals are: polycentric
02. Bonding in metals have been explained by:
 (A) electron free theory (B) Valence bond theory
 (C) molecular orbital theory (band theory)
 (D) All of the above
03. A polymer made up of more than one type of monomer is termed as copolymer
04. Rubber is vulcanised to improve its properties by heating with sulphur
05. Which of the following compounds will exhibit NMR spectroscopy
 (A) ${}^6_6\text{C}^{12}$ (B) ${}^8_8\text{O}^{16}$ (C) ${}_{16}^{32}\text{S}$ (D) ${}^6_6\text{C}^{23}$
06. A good lubricating oil should have:
High viscosity index
07. The geometry and shape of ICl_3
T-shape & trigonal bipyramidal
08. Thermoplastic polymers are having properties like: Reversibility
09. The type of lubrication under condition of low speed and high load is:
 (A) thick film or hydrodynamic lubrication
 (B) thin film or boundary lubrication
 (C) High pressure lubrication
 (D) All of the above
10. Silicones oils are having
 (A) low surface tension (B) possess great wetting ability
 (C) used as lubricants (D) All of the above

1. Lubrication is necessary to prevent wear & tear caused due to frictional forces
2. The value of aniline point for a good lubricant should be high
3. For a molecule to be NMR active;
 - A) $I = 0$ (nuclear spin)
 - B) $I \geq 1$
 - C) $I < 1$
 - D) Both (B) & (C)
4. Nylon is a/an Polyamide
5. The nuclei with spin quantum no. greater than 0 can exhibit the NMR phenomenon
6. Which of the following is used for making chewing gums? Polyvinyl acetate
7. Which of the following is the principle of Atomic absorption spectroscopy?

Radiation is absorbed by non-excited atoms in vapour state & are excited to higher states
8. Which of the following lubricant is set at 3000°C to 40°C temp? MoS_2
9. Polymers are Both A & B in nature

A) Organic B) Inorganic C) Both A & B D) None
10. Which polymer consist of coil-like polymer chains elastomers
11. Molecular geometry of SbCl_2 trigonal pyramidal
12. Which of the following is a compound semiconductor

A) Si B) ~~SiO₂~~ C) Ge D) ~~SiO₂~~



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24) Which of the following molecules contains only single bonds?

(A) CH_3COOH (B) $\text{CH}_3\text{CH}_2\text{COOCH}_3$

(C) C_2H_6 (D) C_6H_6

25) Which of the following is not used as trivalent impurity?

Ga

In

B

As

26) What is the atomic density of silicon?

5×10^{22} atoms/cm³ or 4.9995×10^{22} 1/cm³

27) The forbidden energy gap for Ge is

0.7 eV

28) // // // // // // //

1.1 eV

29) When placed in a magnetic field, all the random spins of the nuclei align with the magnetic field

30) Matrication of rubber means its softening.

31) Which of the following is not a property of lubricants?

(A) High specific Heat

(B) Low pour point

(C) High flash point

(D) Low oxidation stability

32) According to molecular orbital theory, which of the following is correct?

(A) C_2 molecule is diamagnetic

(B) C_2 Ion is paramagnetic

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S-S-P-P-P
P-P-P-d-d-d

S-S-P-P-P
P-P-P-d-d-d

(c) Bond order of O_2 molecule is 2

(d) All of the above

30 Sodium chloride is an Ionic compound whereas hydrogen chloride is mainly covalent because:

Hydrogen is a non-metal

31 valence bond theory is given by Sidgwick & Powell & introduced by Pauling & Slater

32 When atoms overlap across axial modes called sigma bond ' σ '

33 When atoms are parallel overlapping | side wise lapping | lateral overlapping \rightarrow π Bond

34 S-S Bond or ' σ ' Bond or sigma Bond have Non directional spherically symmetrical

35 S-orbitals can never form π Bond.

36 which Bond has more energy, & more Bond length sigma Bond

37 The Bond b/w two atoms is always sigma Bond

38 Bond energy of π overlapping 65K Cal/Mole

39 Bond length in axial overlapping is 80K Cal/Mole less

40 Forbidden gap of Insulator is $\geq 5eV$

41 " " " " conductor is zero

42 " " " " semiconductor $\leq 3eV$

43 Homopolymers are example of Addition polymer

44 Copolymer " " Condensation polymer

45 Polymeric organo silicon compounds containing Si-O-Si bonds are called siloxanes

46 chain length of K_2SiO_3 can be controlled by

47 Natural rubber is a polymer of Isoprene especially trans-1,4 isoprene

- 48 Natural rubber gets affected by the action of Hot acid & volatile solvents
- 49 It becomes sticky at high temp & brittle at lower temp.
- 50 It cannot sustain much stress
- 51 It has large water absorption tendency
- 52 Which temp gets Natural rubber to vulcanise 200° - 250° C of which 1/3 - 1/4
- 53 Which of the following is true - about vulcanised rubber?
 - 1. High tensile strength
 - 2. sustain high stress
 - 3. low water absorp. tendency & resistance to organic solvents
 - 4. low elasticity depending on extent of vulcanisation.
 - 5. ~~All of the above~~
 - 6. Both 1 & 2
 - 7. None
 - 8. Both 1 & 2
- 54 By the increase of sulphur content to the rubber is increased
- 55 for making tires, conveyor belt, rubber band, safety gloves, soles of shoes we use vulcanised rubber
- 56 Who gave structure determination of molecular absorption determination of spectroscopy by Kubrickson in 1925
- 57 NMR spectroscopy 11 to 900 MHz
- 58 In NMR $\Delta E = h\nu$ is called energy diff. or resonance
- 59 NMR is used for study of structure
- 60 photoelectron spectroscopy is used for structure

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friction
or fluid
friction

T ↑
V ↓ P ↑ VT

2 Joule (a)

62 viscosity is a property of a fluid that determines its resistance to flow.

63 viscosity is an indicator of flow ability of lubricating oil

64 The lower the viscosity greater will be the flow ability

65 Temp → ↑ viscosity ↓ pressure.
↑ viscosity ↑

66 unit of viscosity is poise or Centipoise

67 A relatively small change in viscosity with temp is indicated by viscosity index

68 The unit of viscosity index is unitless

69 It acts as a seal, reduces maintenance & running cost, improves efficiency lubricant

70 liquid lubricants include animal oil, vegetable oil, petroleum oil, synthetic lubricants

71 semi solid is formed by emulsifying oil

72 soda based greases are used a thickener used up to 175°C

73 lithium based use emulsifying & are water resistant upto 150°C

74 Calcium soap use 0°C temp.

75 graphite are non-inflammable use 450°C used as powder oil

76 MoS_2 adherent more adherent to the metal used in high speed

GT²

22
22