INORGANIC CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

# DPP No. 18

Total Marks : 26

Max. Time : 28 min.

**Topic : Chemical Bonding**

| Type of Questions | | M.M., Min. |
|---|---|---|
| Single choice Objective ('–1' negative marking) Q.1 to Q.6 | (3 marks, 3 min.) | [18, 18] |
| Subjective Questions ('–1' negative marking) Q.7 to Q.8 | (4 marks, 5 min.) | [8, 10] |

**1.** Which is the hybridization of the central atom of $SiO_2$ :

(A) sp (B) $sp^2$ (C) $sp^3$ (D) $sp^3d$

**2.** In $SO_2$ molecule, there are two $\sigma$-bonds and two $\pi$-bonds. The two $\pi$-bonds are formed by :

(A) $p\pi - p\pi$ overlap between S and O atoms

(B) $sp^2$ – p overlap between S and O atoms

(C) one by $p\pi - p\pi$ overlap and other by $p\pi - d\pi$ overlap

(D) both by $p\pi - d\pi$ overlap

**3.** White phosphours has :

(A) six P – P single bonds (B) four lone pairs of electrons

(C) PPP angle of 60ºC (D) all of these

**4.** **STATEMENT-1 :** $NO_2$ and $ClO_2$ both being odd electron molecules dimerise.

**STATEMENT-2 :** On dimerisation, $NO_2$ is converted to stable $N_2O_4$ molecule with even number of electrons.

(A) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.

(B) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(C) Statement-1 is True, Statement-2 is False

(D) Statement-1 is False, Statement-2 is True

**5.** In $P_4O_{10}$ molecule

(A) There are 4 P–P bond (B) There are 8 P–O bond

(C) The $\hat{POP}$ bond angle is 180° (D) The phosphorus atom is in excited state

**6.** In $P_4S_3$ how many P–P bonds are present.

(A) 3 (B) 4 (C) 5 (D) 2

**7.** Nitrogen exists as diatomic molecule and phosphorus as $P_4$ . Why ?

**8.** In $SiO_2$, each silicon atom is covalently bonded in a tetrahedral manner to four oxygen atoms and each oxygen atom in turn is covalently bonded to another two silicon atoms giving a three dimensional network solid. Find the total number of atoms comprising each ring forming the three dimensional network solid.

# Answer Key

## DPP No. # 18

**1.** (C) **2.** (C) **3.** (D) **4.** (D) **5.** (D)

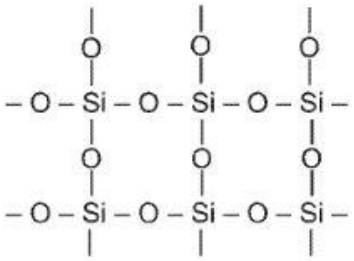
**6.** (A)

**7.** (i) Nitrogen → $p\pi - p\pi$ multiple bond (very high bond enthalpy). (ii) In phosphorus their atomic orbitals are so large and diffuse that they cannot have effective over lapping. **8.** 8

# Hints & Solutions

## DPP No. # 18

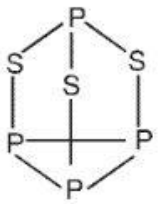
**1.** Structure of $SiO_2$ :



**2.** **(Moderate)**


**4.** $ClO_2$ does not dimerise because odd electron is present in 'd' orbital and is declocalised not localised as in $NO_2$.

**6.** The structure of $P_4S_3$ is



**7.** (i) Nitrogen → $p\pi - p\pi$ multiple bond (very high bond enthalpy).
(ii) In phosphorus their atomic orbitals are so large and diffuse that they cannot have effective over lapping.

**8.**