CBSE TEST PAPER 02

CLASS XI CHEMISTRY (The p-Block Elements)

General Instructions:

- All questions are compulsory.
- Marks are given along with each question.

1. Give the chemical formula of inorganic benzene. [1]

2. Give two examples of electron deficient molecules. [1]

3. Arrange the following halides of boron in the increasing order of acidic character:
BF_3, BCl_3, BBr_3, BI_3. [1]

4. Why is boric acid considered as a weak acid? [1]

5. Is boron a metal, non-metal or metalloid? [1]

6. Aluminium can form $[AlF_6]^{3-}$ whereas boron is unable to form $[BF_6]^{3-}$ ion. Explain. [2]

7. How do Boron and Aluminium interact with aqueous alkalies? [2]

8. The atomic radius of Ga is less than that of Al. Why? [2]

9. Why boron has unusually high melting point? [1]

10. Why does BF_3 act as Lewis acid? [1]

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[ANSWERS]

Ans 1. $B_3N_3H_6$ (Borazine)

Ans 2. BF_3, B_2H_6.

Ans 3. $BF_3 < BCl_3 < BBr_3 < BI_3$.

Ans 4. Boric acid is not able to release H^+ ions on its own. It receives OH^- ions from water molecules to complete its octet and in turn releases H^+ ions.

Ans 5. Boron is a non-metal.

Ans 6. Due to presence of d-orbitals, Al can expand its octet to form bonds with six fluoride ions whereas due to non-availability of d orbitals, B is unable to expand its octet.

Ans 7. Boron does not react with alkalies while aluminium reacts with aqueous alkalies and liberate hydrogen gas.

$2Al + 2NaOH + 6H_2O \rightarrow 2Na^+[Al(OH)_4]^- + 3H_2$

Ans 8. The atomic radius of Ga is less than that of Al is due to the variation in the inner core of the electronic configuration. The presence of additional 10 d-electrons offer only poor screening effect for the outer electrons from the increased nuclear charge in gallium.

Ans 9. Due to very strong crystalline lattice, boron has unusually high melting point.

Ans 10. In BF_3 , boron has only six electrons in its valence shell. It can accept a pair of electrons from any electron-rich molecule to achieve stable electronic configuration and thus, acts as Lewis acid.