

National Institute of Open Schooling
Senior Secondary Course : Chemistry
Lesson 20 :p-block Elements and their Compounds-II
Worksheet-20

		P-BLOCK ELEMENTS						
Groups		13	14	15	16	17	18	
2	He							Group 18: Noble gases
13	B	C	N	O	F	Ne		
14	Al	Si	P	S	Cl	Ar		
15	Ga	Ge	As	Se	Br	Kr		
16	In	Sn	Sb	Te	I	Xe		
17	Tl	Pb	Bi	Po	At	Rn		

↑ Metals ↑ Metalloids ↑ Non-Metals

1. Give reasons for the following:
 - (i) N_2 is less reactive at room temperature.
 - (ii) H_2Te is the strongest reducing agent amongst all the hydrides of group 16-elements.
 - (iii) Helium is used in diving apparatus as a diluent for oxygen.

2. (a) Account for the following:
 - (i) Bond angle in NH_4 is greater than that in NH_3 .
 - (ii) Reducing character decreases from SO_2 to TeO_2 .
 - (iii) $HClO_4$ is a stronger acid than $HClO$.
 (b) Draw the structures of the following:
 - (i) $H_2S_2O_8$
 - (ii) $XeOF_4$.

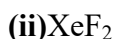
3. Give reasons for the following:
 - (i) NH_3 has a higher boiling point than PH_3 .
 - (ii) H_2Te is more acidic than H_2S .
 - (iii) Chlorine water on standing loses its yellow colour.

4. (a) Account for the following:
 - (i) $Bi(V)$ is stronger oxidising agent than $Sb(V)$.
 - (ii) $H-O-I$ is a weaker acid than $H-O-Cl$.
 - (iii) Bond angle decreases from H_2O to H_2S .

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The diagram shows a portion of the periodic table with groups 13, 14, 15, 16, 17, and 18 highlighted. Elements in these groups are labeled as p-block elements. Arrows point to these groups from the label 'p-BLOCK ELEMENTS'. Below the table, arrows indicate the classification of elements: Metals (groups 1-10), Metalloids (groups 11-12), and Non-Metals (groups 13-18).

(b) Draw the structures of the following:



5. (i) Why does PCl₅ fume in moisture?

(ii) Write the name of the allotrope of sulphur which is stable at room temperature.

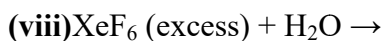
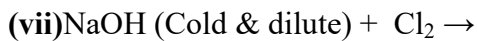
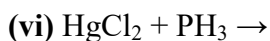
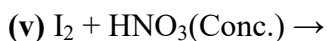
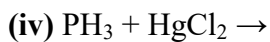
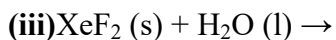
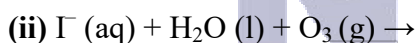
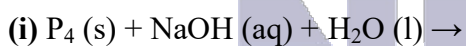
(iii) Chlorine water on standing loses its yellow colour. Why?

(iv) Write the disproportionation reaction of H₃PO₃.

(v) Complete the following equation: F₂ + H₂O →

6. Why does NO₂ dimerise?

7. Complete these chemical reaction equations :



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Groups	13	14	15	16	17	18	
	5 B	6 C	7 N	8 O	9 F	10 Ne	Group 12 elements
13	14	15	16	17	18		Group 13 elements
Al	Si	P	S	Cl	Ar		Group 14 elements
Ga	Ge	As	Se	Br	Kr		Group 15 elements
In	Sn	Pb	Tl	Po	At		Group 16 elements
Tl	Pb	Bi	Po	At	Rn		Group 17 elements

8. Draw the structures of white phosphorus and red phosphorus. Which phosphorus is more reactive and why?
9. State the reasons:
 - (a) The N-O bond in NO_2^- is shorter than the N-O bond in NO_3^-
 - (b) SF_6 is kinetically an inert substance.
 - (c) All the P-Cl bonds in PCl_5 molecules are not equivalent.
 - (d) Sulphur has a greater tendency for catenation than oxygen.
10. What happens when:
 - (i) PCl_5 is heated
 - (ii) H_3PO_3 is heated

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