

Exercise X

- 1) Draw the geometry of the following molecules: PCl_3 , N_2O , NO_2
- 2) What type of reaction is the conversion of H_3PO_4 to $\text{H}_4\text{P}_2\text{O}_7$:
neutralization, hydrolysis, condensation or reduction ?
- 3) Which of the following compounds is not a radical: NO_2 , NO , FNO , or NF_2
- 4) Why is the bond distance in the peroxide ion longer than in O_2 ?
- 5) Which statement is incorrect?
 - H_2O_2 is kinetically stable with respect to decomposition to H_2O and O_2
 - H_2O_2 is thermodynamically stable with respect to decomposition to H_2O and O_2
 - H_2O_2 is explosive when in contact with readily oxidized materials
 - H_2O_2 reacts with Cl_2 to release O_2
- 6) Cl_2O_7 is the anhydride of what acid: HOCl , HClO_2 , HClO_3 or HClO_4 ?
- 7) Which statement is incorrect about the hydrogen halides?
 - Each gaseous HX molecule is polar
 - All are gases at 298 K
 - Bond dissociation energies for HX decrease down the group
 - For each HX , the $\text{p}K_a$ value is negative indicating that each is a strong acid
- 8) Which compound is paramagnetic: Cl_2O , ClO_2 , Cl_2O_6 or Cl_2O_7 ?
- 9) In which reaction is iodine oxidized?
 - $\text{I}_2 + \text{Br}_2 \rightarrow 2 \text{IBr}$
 - $\text{IF}_5 + 2 \text{SbF}_5 \rightarrow (\text{IF}_4)(\text{Sb}_2\text{F}_{11})$
 - $\text{I}_2\text{O}_5 + \text{H}_2\text{O} \rightarrow 2 \text{HIO}_3$
 - $\text{IF}_3 + \text{Me}_4\text{NF} \rightarrow (\text{Me}_4\text{N})(\text{IF}_4)$
- 10) What is the formula of hypochlorous acid ?