

**LEWIS DOT STRUCTURES AND MOLECULAR GEOMETRY PROBLEM SET**

1. Write the Lewis dot structures, including formal charges as well as resonance forms for each of the following:
  - (a)  $\text{O}_2\text{NCl}$  (show the two most important resonance structures)
  - (b)  $\text{ClO}_4^-$  (show three resonance structures including the most probable)
  - (c)  $\text{FNNF}$
  - (d)  $\text{FNO}$
  - (e)  $\text{H}_2\text{O}_2$
  
2. For each of the following species write down:
  - (i) a sketch of the molecular shape (including bond angles) showing all bonding and non-bonding pairs around the central atom,
  - (ii) name of the geometric shape of the species,
  - (iii) polarity of the species (i.e. polar or non-polar)
  - (a)  $\text{KrO}_2\text{F}_2$
  - (b)  $\text{H}_2\text{CO}$
  - (c)  $\text{OCCCCO}$  (atoms bonded as shown)
  - (d)  $\text{Br}_3^-$
  - (e)  $\text{BiI}_3$
  - (f)  $\text{ICl}_3$
  
3. For each of the species in question #2 specify the type of hybrid orbitals used by each of the central atoms in each case.