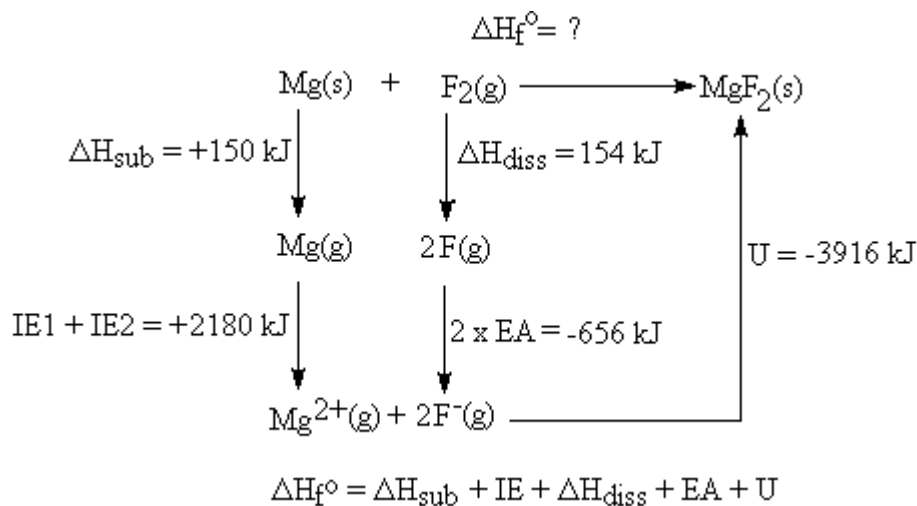


20. a. Rb < K < Na
 b. Ga < B < O
 c. Br < Cl < F
 d. S < O < F
22. a. Sn-H
 b. Tl-Br
 c. Si-O
 d. O-F
28. S $1s^2 2s^2 2p^6 3s^2 3p \uparrow \downarrow \uparrow \underline{\quad}$
 $S^{2-} 1s^2 2s^2 2p^6 3s^2 3p^6$
- Br $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p \uparrow \downarrow \uparrow \downarrow \uparrow \underline{\quad}$
 $Br^- 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$
- Ra $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^2$
 $Ra^{2+} 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6$
- Cs $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s \uparrow \underline{\quad}$
 $Cs^+ 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6$
34. Ar 18 e- $Sc^{3+} < Ca^{2+} < K^+ < Cl^- < S^{2-} < P^{3-}$
36. a. $V > V^{2+} > V^{3+} > V^{5+}$
 b. $Cs^+ > Rb^+ > K^+ > Na^+$
 c. $Te^{2-} > I^- > Cs^+ > Ba^{2+}$
 d. $P^{3-} > P^{2-} > P^- > P$
 e. $Te^{2-} > Se^{2-} > S^{2-} > O^{2-}$
38. a. Al^{3+} Cl^- $AlCl_3$ aluminum chloride
 b. Na^+ O^{2-} Na_2O sodium oxide
 a. Sr^{2+} F^- SrF_2 strontium fluoride
 a. Ca^{2+} S^{2-} CaS calcium sulfide
40. a. LiF closer ions
 b. NaBr closer ions
 c. BaO product of charges larger
 d. $CaSO_4$ product of charges larger
 e. K_2O product of charges larger
 f. Li_2O closer ions

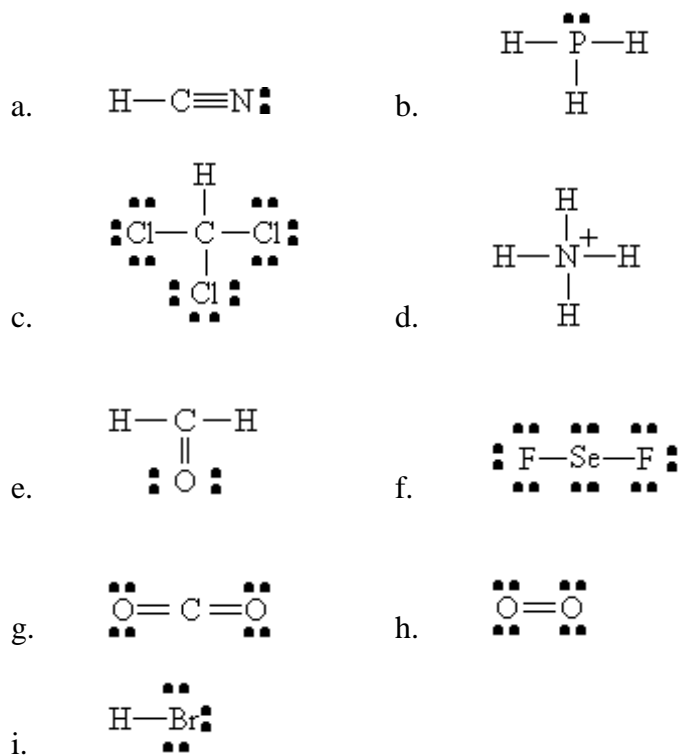
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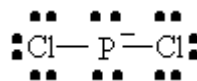
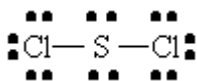
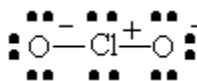
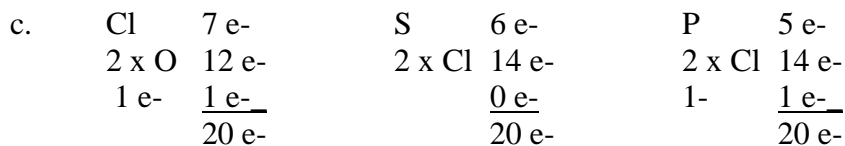
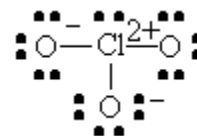
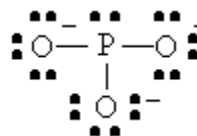
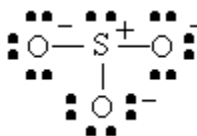
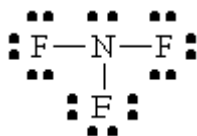
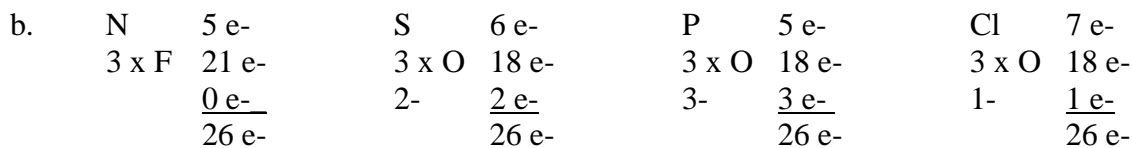
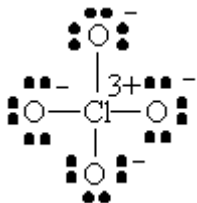
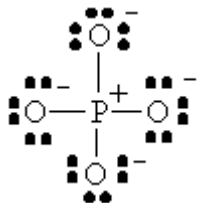
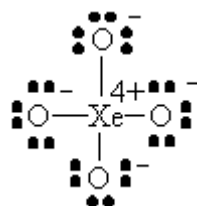
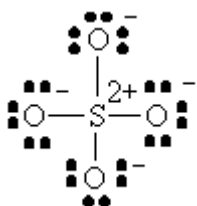
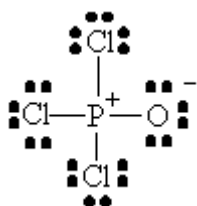
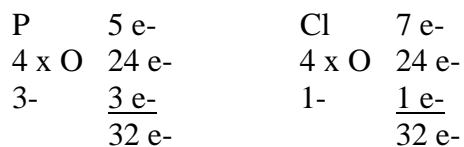
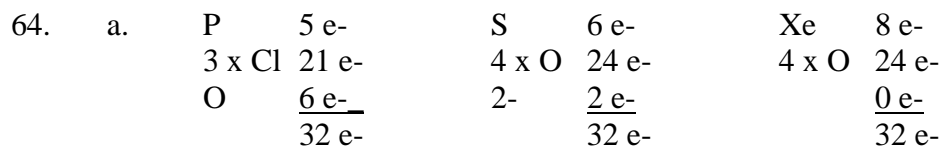


$$\Delta H_f^\circ = 150 + 2180 + 154 + (-656) + (-3916)$$

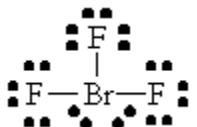
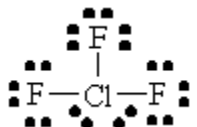
$$\Delta H_f^\circ = \mathbf{-2088 \text{ kJ}}$$

63.

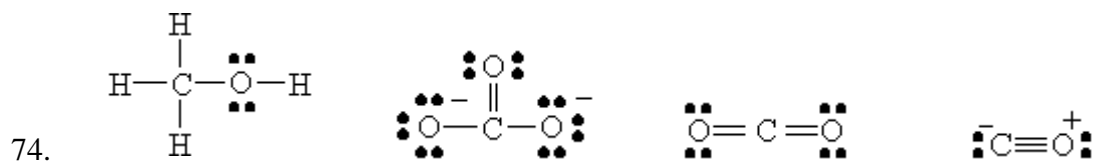
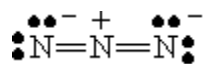
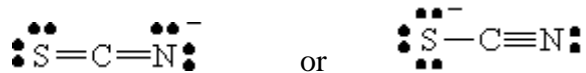
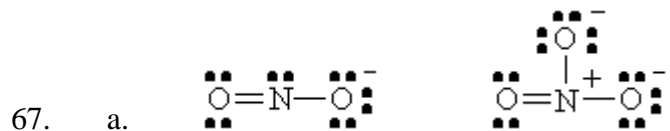
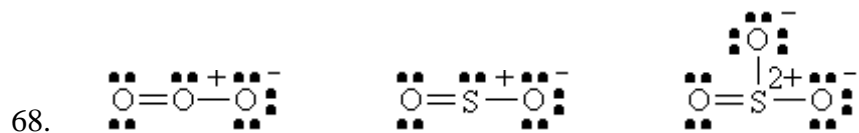




d. Same number of e-, same structure.



66.

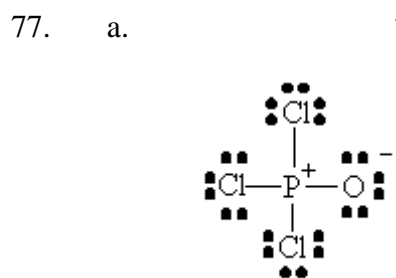


1
longest
1
weakest

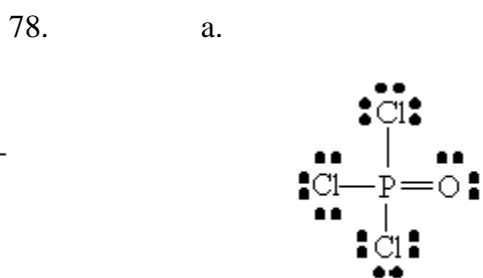
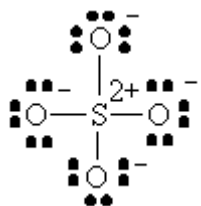
2
2

3
3

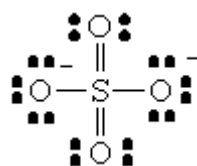
4
shortest
4
strongest



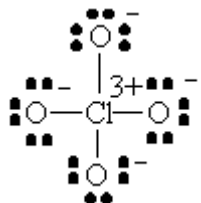
b.



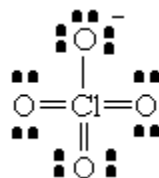
b.



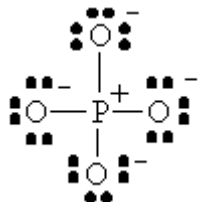
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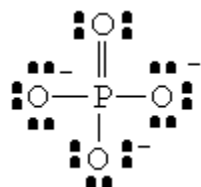
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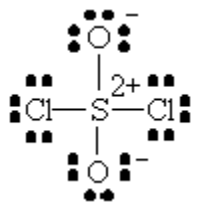
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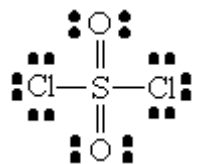
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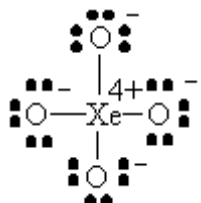
e.



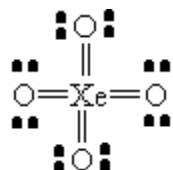
e.



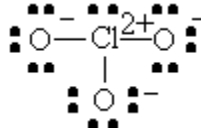
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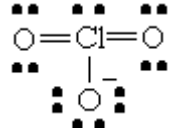
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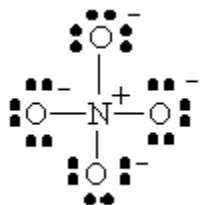
g.



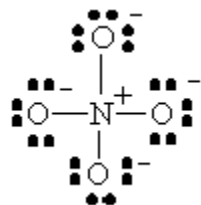
g.

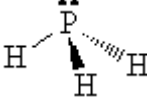
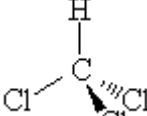
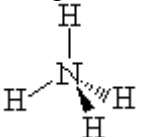
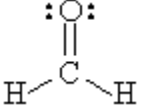
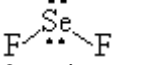
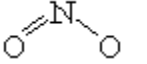
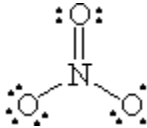


h.

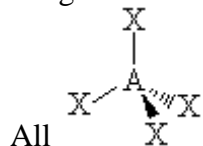


h.

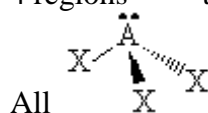


79.	a.	2 regions	linear	no lone-pairs - linear	180°
	b.	4 regions	tetrahedral	1 lone-pair - trigonal pyramid	109.5°
					
	c.	4 regions	tetrahedral	no lone-pair - tetrahedral	109.5°
					
	d.	4 regions	tetrahedral	no lone-pair - tetrahedral	109.5°
					
	e.	3 regions	trigonal planar	no lone-pair - trigonal planar	120°
					
	f.	4 regions	tetrahedral	2 lone-pair - bent	109.5°
					
	g.	2 regions	linear	no lone-pairs - linear	180°
	h.	2 atoms	linear	180°	
	i.	2 atoms	linear	180°	
	a.	3 regions	trigonal planar	1 lone-pair - bent	120°
					
		3 regions	trigonal planar	no lone-pair - trigonal planar	120°
					
	b.	2 regions	linear	no lone-pairs - linear	180°
		2 regions	linear	no lone-pairs - linear	180°
		2 regions	linear	no lone-pairs - linear	180°

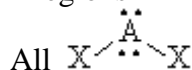
80.	a.	4 regions	tetrahedral	no lone-pair - tetrahedral	109.5°
		4 regions	tetrahedral	no lone-pair - tetrahedral	109.5°
		4 regions	tetrahedral	no lone-pair - tetrahedral	109.5°
		4 regions	tetrahedral	no lone-pair - tetrahedral	109.5°
		4 regions	tetrahedral	no lone-pair - tetrahedral	109.5°



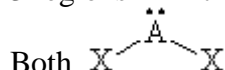
b.	4 regions	tetrahedral	1 lone-pair - trigonal pyramid	109.5°
	4 regions	tetrahedral	1 lone-pair - trigonal pyramid	109.5°
	4 regions	tetrahedral	1 lone-pair - trigonal pyramid	109.5°



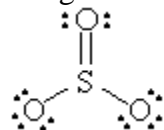
c.	4 regions	tetrahedral	2 lone-pair - bent	109.5°
	4 regions	tetrahedral	2 lone-pair - bent	109.5°
	4 regions	tetrahedral	2 lone-pair - bent	109.5°



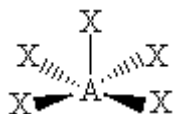
Both	3 regions	trigonal planar	1 lone-pair - bent	120°
	3 regions	trigonal planar	1 lone-pair - bent	120°



3 regions	trigonal planar	no lone-pair - trigonal planar	120°
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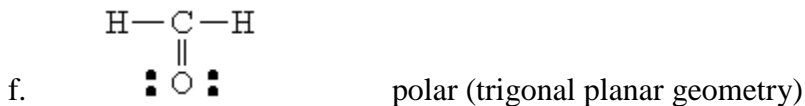
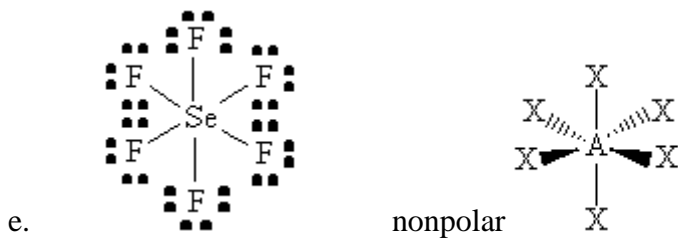
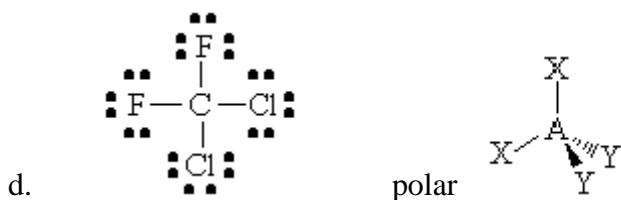
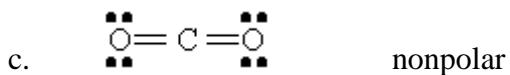
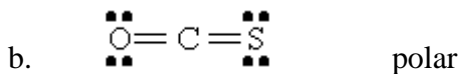
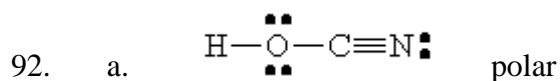
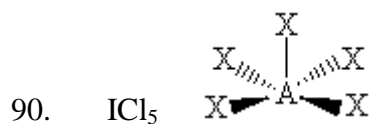
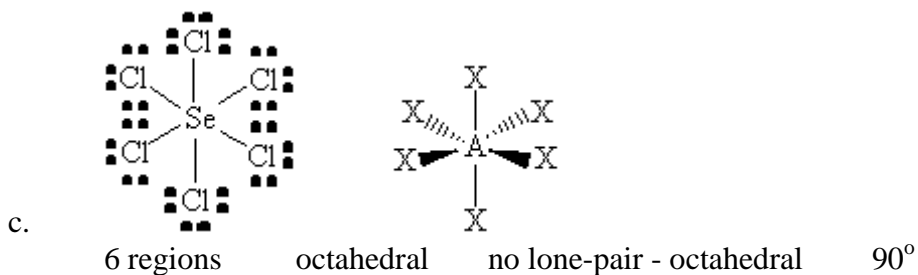


86.	a.		octahedral	1 lone-pair - square pyramid	90°
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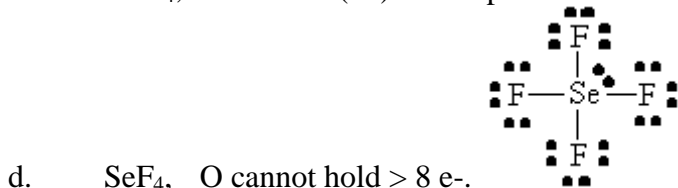


b.	6 regions		octahedral	2 lone-pair - square planar	90°
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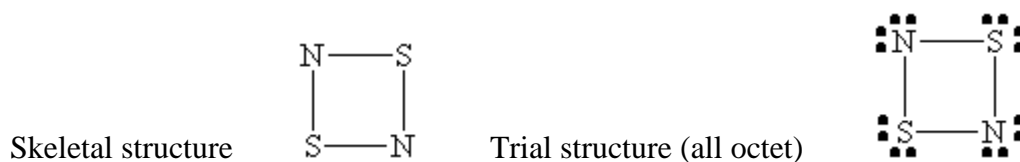




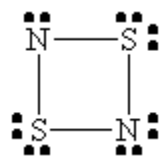
102. a. NaBr , too much energy needed to make Na^{2+} .
 b. ClO_4^- , ClO_4 has an odd number of e-.
 c. XeO_4 , too few e- (30) to complete octet.



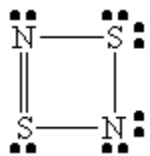
$$\begin{array}{r}
 104. \quad 2 \times \text{N} \quad 10 \text{ e}^- \\
 \quad \quad 2 \times \text{S} \quad \underline{12 \text{ e}^-} \\
 \quad \quad \quad \quad 22 \text{ e}^-
 \end{array}$$



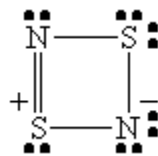
Trial structure has too many e⁻ (24 versus the required 22). Remove any 2 e⁻:



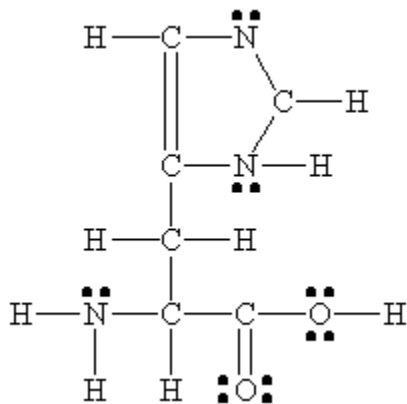
(the upper N, in this case). Now, the N does not have an octet. Move a pair from an adjacent S to make a double bond.



Finally, indicate the formal charge:



118.



- | | |
|---|--------|
| 1 | 120° |
| 2 | 109.5° |