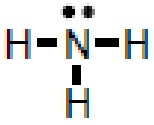
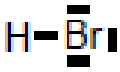
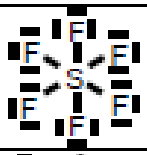
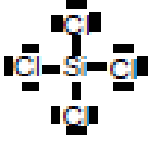
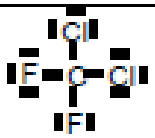
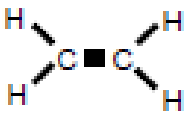
Electronegativity

For our purposes use the definitions in the chart. The most polar bond determines the polarity of a molecule (i.e. if a compound contains one non-polar, and one polar bond the molecule, as a whole, is considered to be polar)

% ionic character	ΔEN	polarity
0 – 10	0 – 0.5	non-polar
10 – 50	0.5 – 1.7	polar (covalent)
50 – 100	1.7 +	ionic

A	B	C	D	E	F	G
Molecule	Lewis structure	Draw shape. Indicate bond dipoles	ΔEN of bonds	Polarity of bonds (ignore shape)	Symmetrical molecule? (i.e. all pulls cancel out)	Polarity of molecule
1. NH_3			3.1 – 2.1 = 1.0	polar	No	polar
2. N_2						
3. HBr		 H Br				
4. OCl_2						
5. SF_6						
6. SO_2						
7. $SiCl_4$						
8. CF_2Cl_2			C-F: C-Cl:			
9. XeF_4 Note: the EN for Xe is 2.6						
10. C_2H_4			C-C: C-H:			

Q – which binary (two element) compound would have the greatest ΔEN?

Electronegativity

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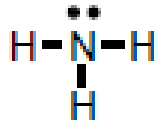
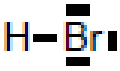
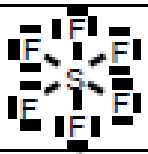
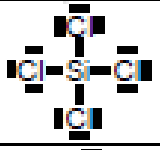
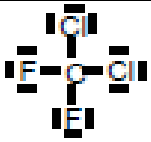
A	B	C	D	E	F	G
Molecule	Lewis structure	Draw shape. Indicate bond dipoles	ΔEN of bonds	Polarity of bonds (ignore shape)	Symmetrical molecule?	Polarity of molecule
1. NH_3			3.1 – 2.1 = 1.0	polar	No	polar
2. N_2		No dipole 	3.1 – 3.1 = 0	non-polar	Yes	non-polar
3. HBr		 H Br	2.8 – 2.1 = 0.7	polar	No	polar
4. OCl_2			3.5 – 2.9 = 0.6	polar	No	polar
5. SF_6		 All away from centre	4.1 – 2.4 = 1.7	polar / ionic	Yes	non-polar
6. SO_2			3.5 – 2.4 = 1.1	polar	No	polar
7. $SiCl_4$		 All away from centre	2.9 – 1.8 = 1.1	polar	Yes	non-polar
8. CF_2Cl_2		 All away from centre	C-F: 4.1 – 2.5 = 1.6 C-Cl: 2.9 – 2.5 =0.4	polar non-polar	No (yes if you think just about shape, but no because Cl and F are different)	polar
9. XeF_4		 All away from centre	(4.1 – 2.6 = 1.5)	(polar)	Yes	non-polar
10. C_2H_4		(small dipoles) 	C-C: 2.5 – 2.5 = 0 C-H: 2.5 – 2.1 =0.4	non-polar non-polar	Yes	non-polar

Q1 – which binary (two element) compound would have the greatest ΔEN? FrF - ΔEN = 4.1 - 0.9 = 3.2 (ionic)