

Table 1. The Various Shapes of Molecules and Polyatomic Ions

Note: central atom = A

bonding atom (i.e. bonding EPD) = B

lone pair of electrons (or non-bonding EPD) on central atom =E

total # of EPD = bonding e-pairs + lone (non-bonding) electron pairs

Formula	Total # of EPD	# bonding pairs of e-	# non-bonding (or lone) pairs of electrons	Lewis Structure (single bonds only)	electronic geometry (geometric arrangement)	molecular geometry (shape)	Bond Angle(s)
AB ₂	2	2	0		linear	linear	
AB ₃	3	3	0		trigonal planar	trigonal planar	
AB ₂ E	3	2	1		trigonal planar	angular or bent	
AB ₄	4	4	0		tetrahedral	tetrahedral	
AB ₃ E	4	3	1		tetrahedral	pyramidal	
AB ₂ E ₂	4	2	2		tetrahedral	angular or bent	
AB ₅	5	5	0		trigonal bipyramidal	trigonal bipyramidal	

Formula	Total # of EPD	# bonding pairs of e-	# non-bonding (or lone) pairs of electrons	Lewis Structure (single bonds only)	electronic geometry (geometric arrangement)	molecular geometry (shape)	Bond Angle(s)
AB_4E	5	4	1		trigonal bipyramidal	see-saw	
AB_3E_2	5	3	2		trigonal bipyramidal	T-shape	
AB_2E_3	5	2	3		trigonal bipyramidal	linear	
AB_6	6	6	0		octahedral	octahedral	
AB_5E	6	5	1		octahedral	square- based pyramidal	
AB_4E_2	6	4	2		octahedral	square planar	

Table 2. Complete the following table. Leave the column entitled "Polarity" blank for the time being.

Formula	Lewis Structure	Total EPD on central atom	# bonding EPD on central atom	# non-bonding EPD on central atom	electronic geometry	molecular geometry	Polar or Non-polar? (exclude ions)
CH ₄							
NH ₃							
BF ₃							
SCl ₂							
SF ₆							

Formula	Lewis Structure	Total EPD on central atom	# bonding EPD on central atom	# non-bonding EPD on central atom	electronic geometry	molecular geometry	Polar or Non-polar? (exclude ions)
TiCl_4							
XeF_2							
NO_3^-							
NO_2^-							

Formula	Lewis Structure	Total EPD on central atom	# bonding EPD on central atom	# non-bonding EPD on central atom	electronic geometry	molecular geometry	Polar or Non-polar? (exclude ions)
CS ₂							
AsF ₃							
MoF ₆							