4 atoms

Point group	Shape	Example	Dihedrals
T_d	Regular Pyramidal	P_4	$\cos^{-1}\left(\frac{1}{3}\right)$
C_{3v}	Pyramidal	NH_3	$\cos^{-1}\left(\frac{\cos\theta(1-\cos\theta)}{\sin^2\theta}\right)$
C_s	Pyramidal	Cl_2OS	$\cos^{-1}\left(\frac{\cos\theta-\cos^2\varphi}{\sin^2\varphi}\right)$
C_{2v}	Pyramidal	H_2Si_2	$\cos^{-1}\left(\frac{\cos\theta-\cos^2\varphi}{\sin^2\varphi}\right)$
C_2	Pyramidal	H_2O_2	$\cos^{-1}\left(\frac{\cos\theta-\cos^2\varphi}{\sin^2\varphi}\right)$
C_1	Pyramidal	H_2OS	$\cos^{-1}\left(\frac{\cos\theta-\cos\varphi\cos\phi}{\sin\varphi\sin\phi}\right)$
D_{3h}	Planar	BH_3	0 or 180
C_s	Planar	$HNSi_2$	0 or 180
D_{2h}	Planar	Br_2Na_2	0 or 180
C_{2h}	Planar	$(HI)_2$	0 or 180
C_{2v}	Planar?	O_2S_2	0 or 180
C_{2v}	Planar?	CFO_2	0 or 180
$C_{\infty v}$	Linear	CAgIO	0 or 180
$D_{\infty h}$	Linear	C_2H_2	0 or 180
C_{2v}		$(Ar_2)(HCl)$	
C_s		$(HCl)_2$	
C_2		$(HF)_2$	

5 atoms

Point group	Shape	Example	Dihedrals
T_d		O_4Os	$\cos^{-1}\left(\frac{1}{3}\right)$?
C_{3v}		ClH_3Si	
C_{3v}		KrO_3S	
C_{2v}		Cl_4Te	
C_{2v}		C_3H_2	
C_{2v}		H_2I_2Si	
C_{2v}		H_2O_2Si	
C_{2v}		$(CO_2)(N_2)$	
C_s(syn)		BFH_2O	
C_s(syn-anti)		CH_2O_2	
C_s		CN_4	
C_s		C_2H_3	
C_s		BF_2HO	
C_s		CH_3OH	
C_s		ClH_2NaO	
C_s		HNO_3	
C_s		H_2O_2Si	
C_s	Non-planar	CH_2N_2	
C_s		$CBrF_2N$	
C_s		$CHClF_2$	
C_s		$(CO)(N_2O)$	
C_s(effective)		ArH_3N	
C_s(effective)		$(SO_2)(CO)$	
C_s(assumed)		H_2N_2O	Given!
$C_{\infty v}$	Linear	CH_3N	
	Linear	$(CO)(HCN)$	
$D_{\infty h}$	Linear	C_5	
$D_{\infty h}$	Linear	C_3Ge_2	
$D_{\infty h}$	Linear	C_3H_2	
	Quasi-linear	C_3O_2	