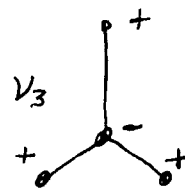
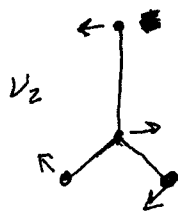
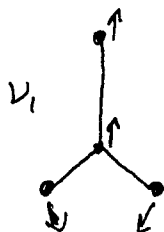


Practice Quiz

- ① H_2BF is trigonal planar and has C_{2v} symmetry
- Ⓐ how many normal modes does it have?

Ⓑ Three of the normal modes are



Give the representation (A_1, A_2, B_1, B_2) of each of these three vibrations (character table below)

- Ⓒ Which modes are IR active? Which modes are Raman active?

C_{2v}	E	C_2	σ_v	σ_v'		
A_1	1	1	1	1	Z	x^2, y^2, z^2
A_2	1	1	-1	-1	R_z	xy
B_1	1	-1	1	-1	x, R_y	xz
B_2	1	-1	-1	1	y, R_x	yz
Γ_{IR}	3	-1	1	1		

- ② Use a four level system to show how one can achieve the necessary population inversion to get lasing.

- ③ sketch a general schematic for a laser operating in narrowband mode. Label all parts