Is the molecule IR active

① molecular shape & polar bonds

separation of charge

valence e-'s = 4+6 = 10

cloud of e-'s

electronegativity - tendency for an atom to pull e- density towards itself in a bond

Homework

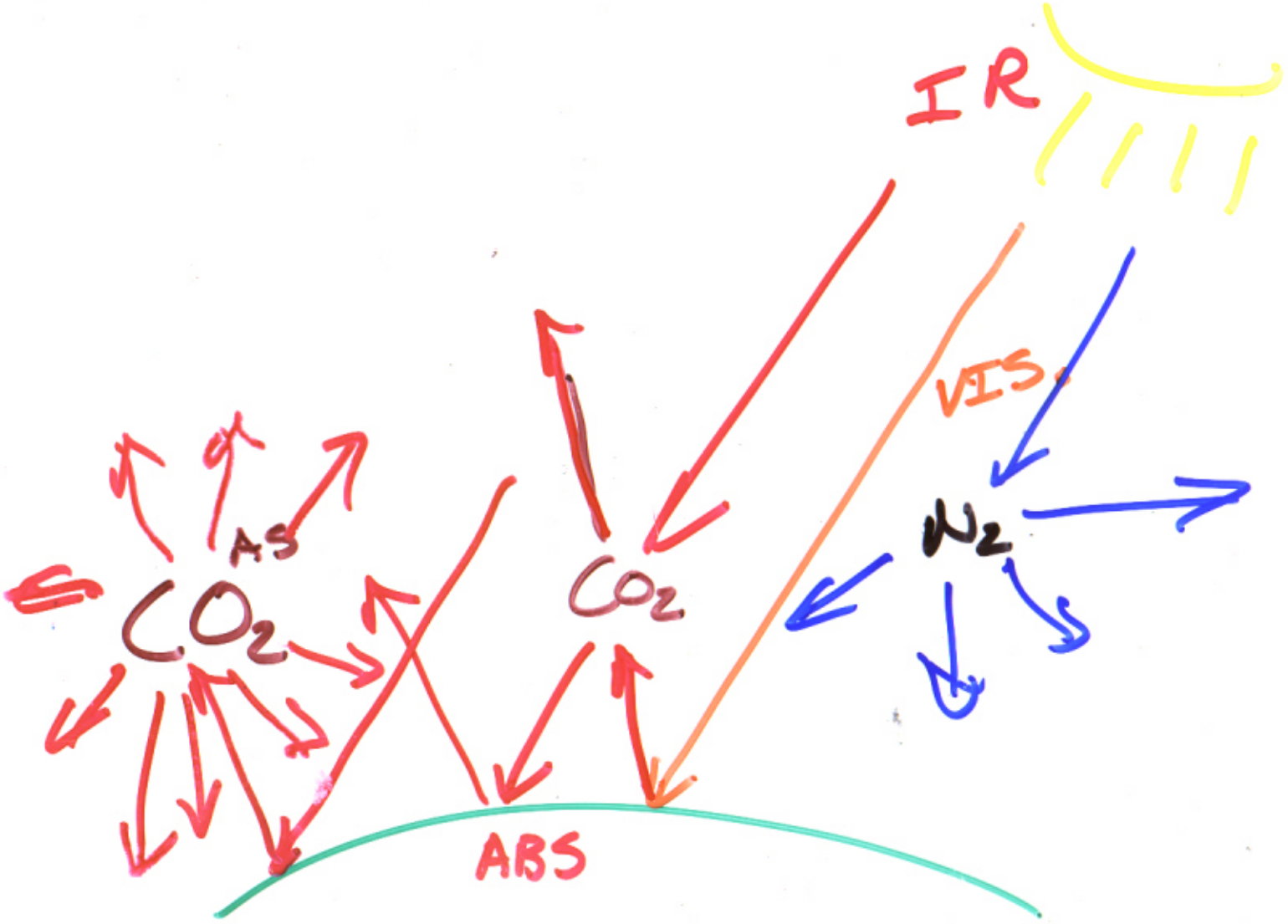
determine which vibrations are IR active for

CO_2, H_2O, N_2O

do #2&3 on p 27 of global warming module

summarize "what determines whether a gas is a greenhouse gas?"

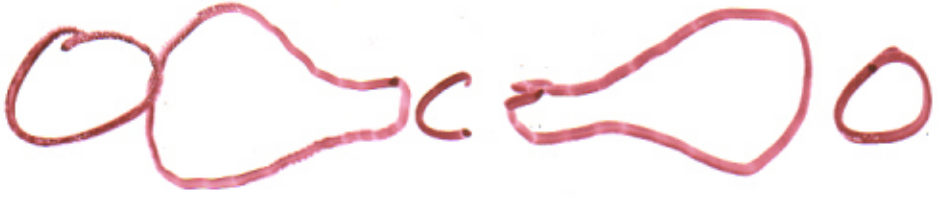
Due week 5


IR
VIS
AS
CO_2
CO_2
N_2
ABS

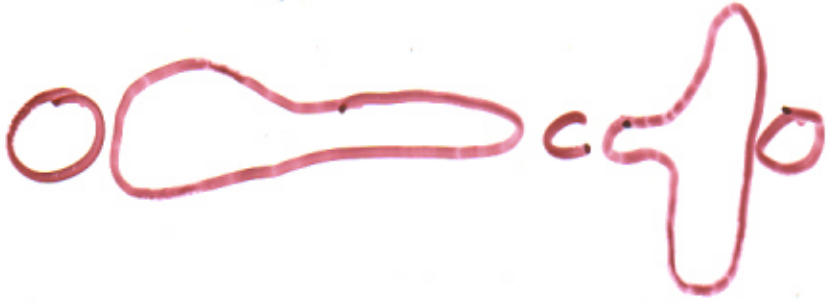
Asym.

ADD VECTORS

NET CHANGE IN DIPOLE MOMENT

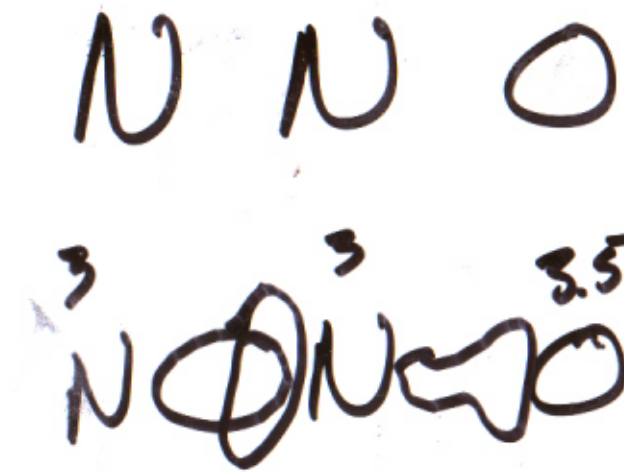


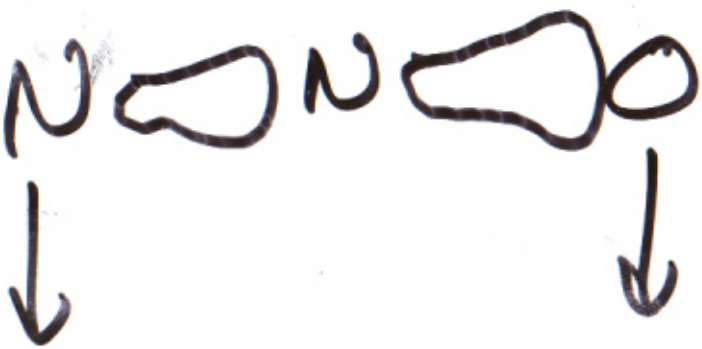
SYMMETRIC

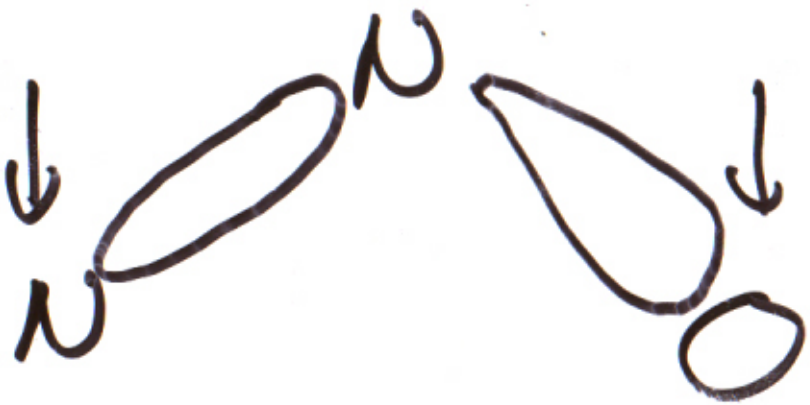


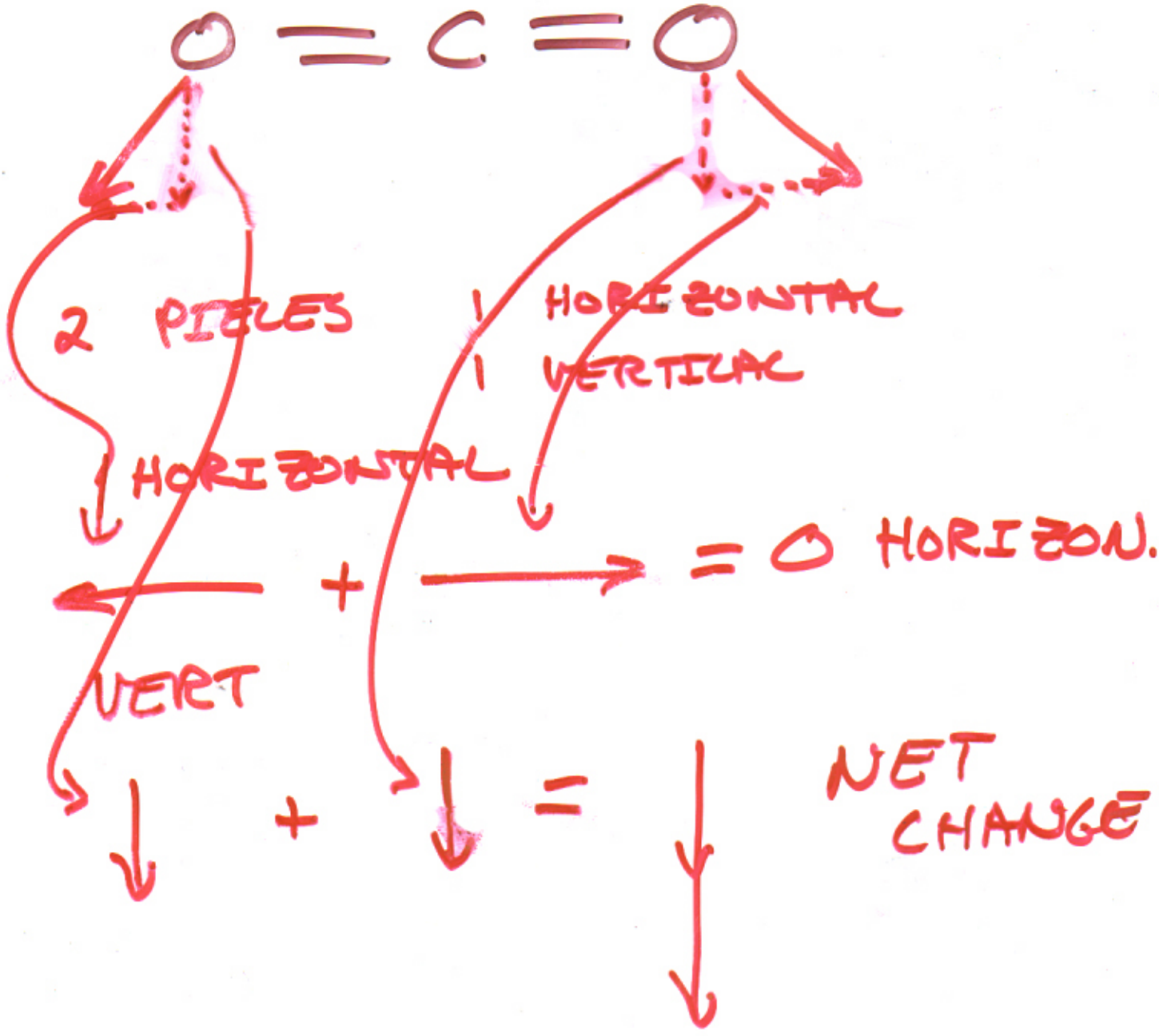
ASYM.

DIPOLE MOMENT








O = C = O
2 PIECES
1 HORIZONTAL
1 VERTICAL
HORIZONTAL
= 0 HORIZON.
VERT
NET CHANGE

$O_2 = 21^+$

$N_2 = 70^+$

VECTORS

- DIRECTION
- AMOUNT

ADD VECTORS

TIP TO TAIL

NET CHANGE = 0

SYMMETRICAL

ADD VECTORS

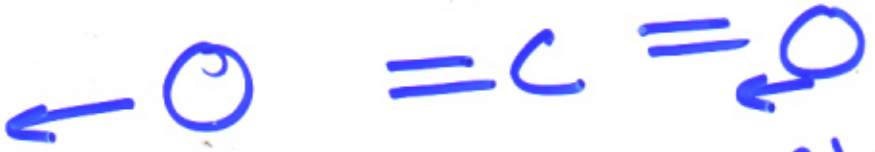
NO NET CHANGE

A molecule will absorb IR radiation during vibration if it has a change in the dipole moment during vibration

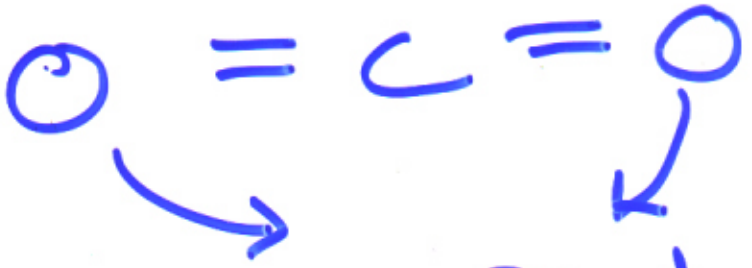
nonpolar bond

Sketch each molecular vibrations

symmetric stretch



asymmetric stretch



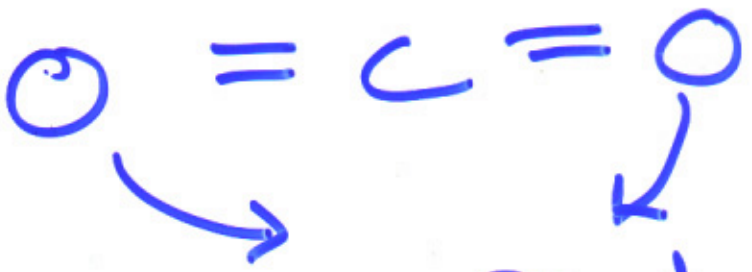
Bend

nonpolar bond

Sketch each molecular vibrations

symmetric stretch

asymmetric stretch



Bend