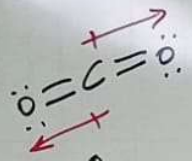
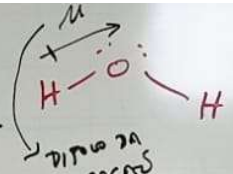
Geometria molecular (VSEPR)

Prof. Diego J. Raposo
UPE – Poli
2025.2

GEOMETRIA MOLECULAR



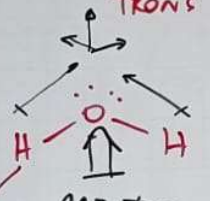
$M_R = 0$



LEWIS: CONECTIVIDADE, LIGAÇÕES SIMPLES/MÚLTIPLAS, PARES DE ELÉTRONS LIVRES, POLARIDADE DAS LIGAÇÕES

MOLÉCULAS APOLARES

VSEPR (MODELO DE REPULSÃO DOS PARES DE ELÉTRONS DA CAMADA DE VALÊNCIA): FORMA E POLARIDADE DA MOLÉCULA

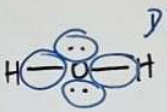


$M_R \neq 0$

MOLÉCULAS POLARES

DOMÍNIOS ELETRÔNICOS (DE)

- DOMÍNIO LIGANTE (DL)
- DOMÍNIO NÃO LIGANTE (DN)



DE = 4

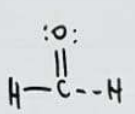
DL = 2

DN = 2

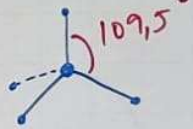
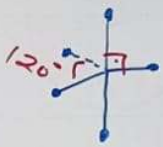
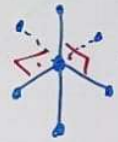
$DE = DL + DN$

DE = 3

DL = 3



DN = 0

DE	FORMA	
2		LINEAR
3		TRIGONAL PLANA
4		TETRAÉDRICA
5		BIPIRÂMIDE TRIGONAL
6		OCTAÉDRICA

FORMA ⇔ DE

GEOMETRIA ⇔ DL

ALGUMAS GEOMETRIAS

ANGULAR :

QUANDO

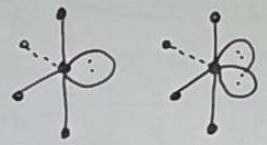
DE = DL

FORMA = GEOMETRIA

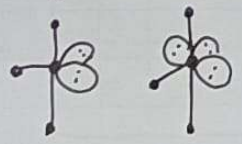
PIRAMIDE TRIGONAL :

QUADRADO PLANAR :

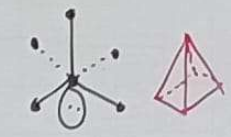
GANGORRA :



FORMA DE T :



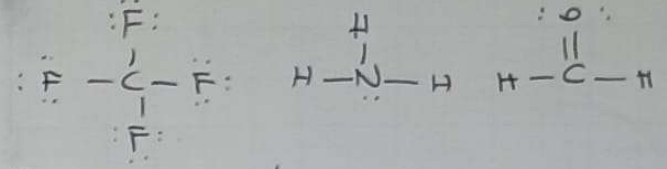
PIRÂMIDE DE BASE QUADRADA :



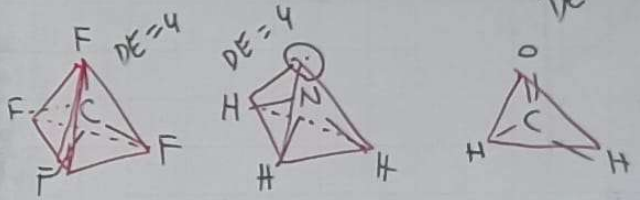
DETERMINE A GEOMETRIA MOLECULAR E AS PROPRIEDADES DAS MOLÉCULAS A SEGUIR:

CF_4 NH_3 CH_2O

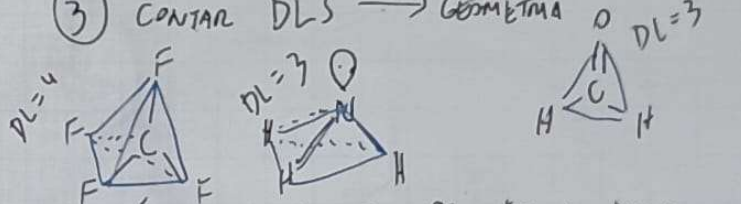
(1) ESTRUTURAS DE LEWIS



(2) CONTAR DE'S → FORMA



(3) CONTAR DL'S → GEOMETRIA

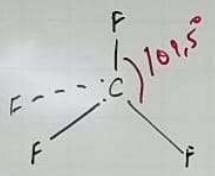


TETRAÉDRICA PIRÂMIDE TRIGONAL TRIGONAL PLANA

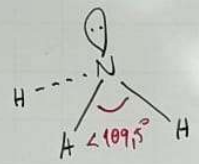
(4) DETERMINAR ÂNGULOS

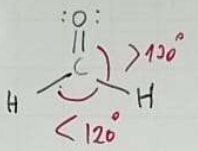
PARES DE ELETRÕES LIVRES

LIGAÇÕES MÚLTIPLAS



TETRAEDRO PERFEITO

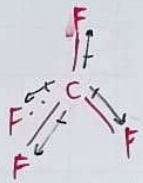




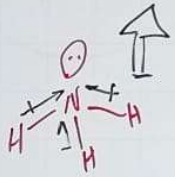
REPULSÃO CRESCE

REPULSÃO CRESCE

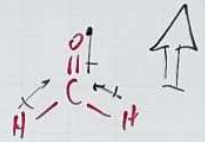
(5) DETERMINAR POLARIDADE DA MOLÉCULA



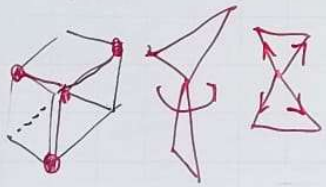
$\mu_R = 0 \Rightarrow$ APOLAR



$\mu_R \neq 0 \Rightarrow$ POLAR

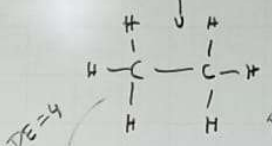


$\mu_R \neq 0 \Rightarrow$ POLAR

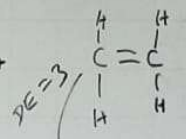


(6) MAIS DE UM ÁTOMO CENTRAL

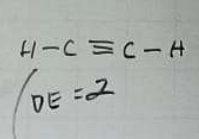
C_2H_6 C_2H_4 C_2H_2



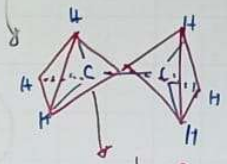
DE = 4



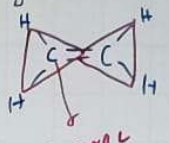
DE = 3



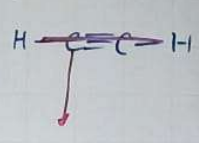
DE = 2



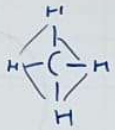
TETRAÉDRICA

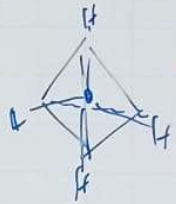


TRIGONAL PLANO



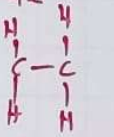
LINEAR





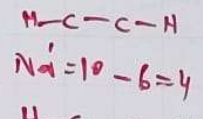
C_2H_4

Nav = 2.4+4.1 = 12



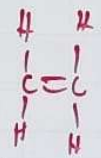
C_2H_2

Nav = 2.4+2.1 = 10



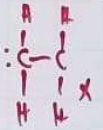
Nav = 10 − 6 = 4

H—C C—H



Nav = 12 − 12 = 0

Nav = 12 − 10 = 2



Ok

Obrigado e boa sorte!