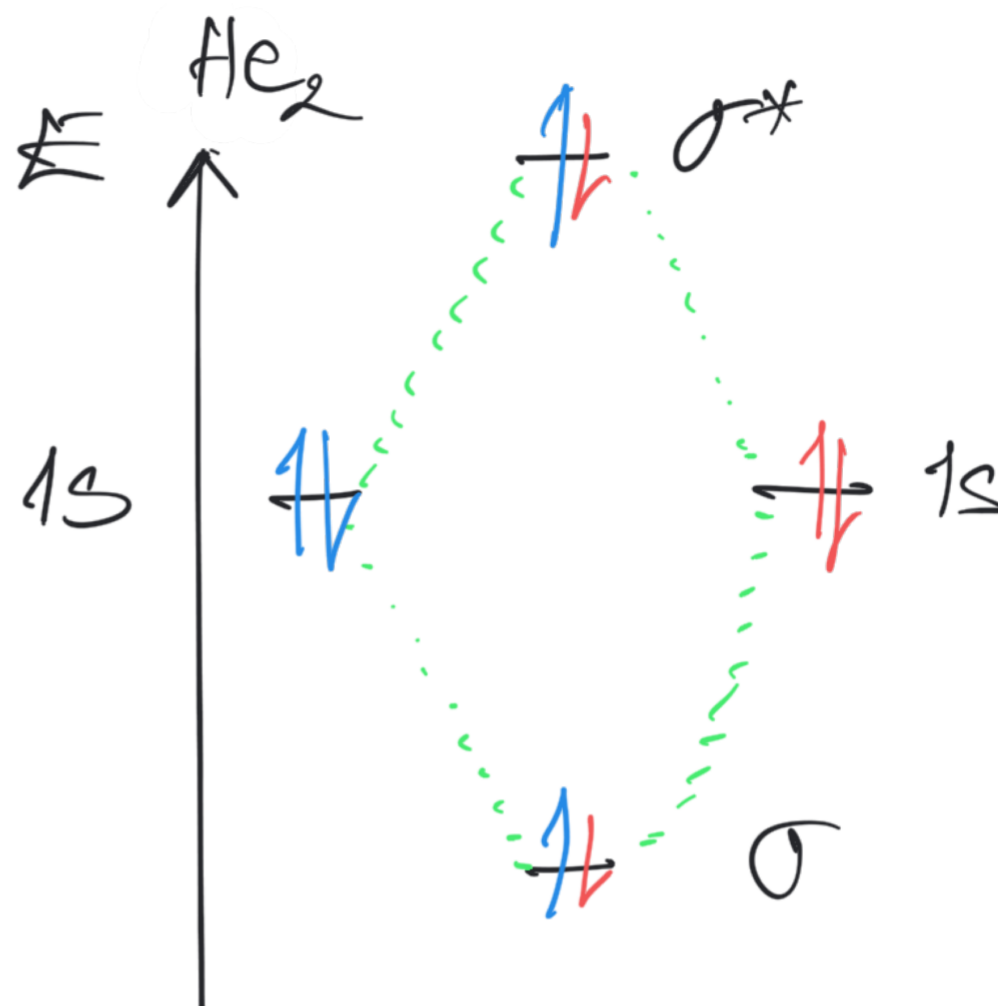
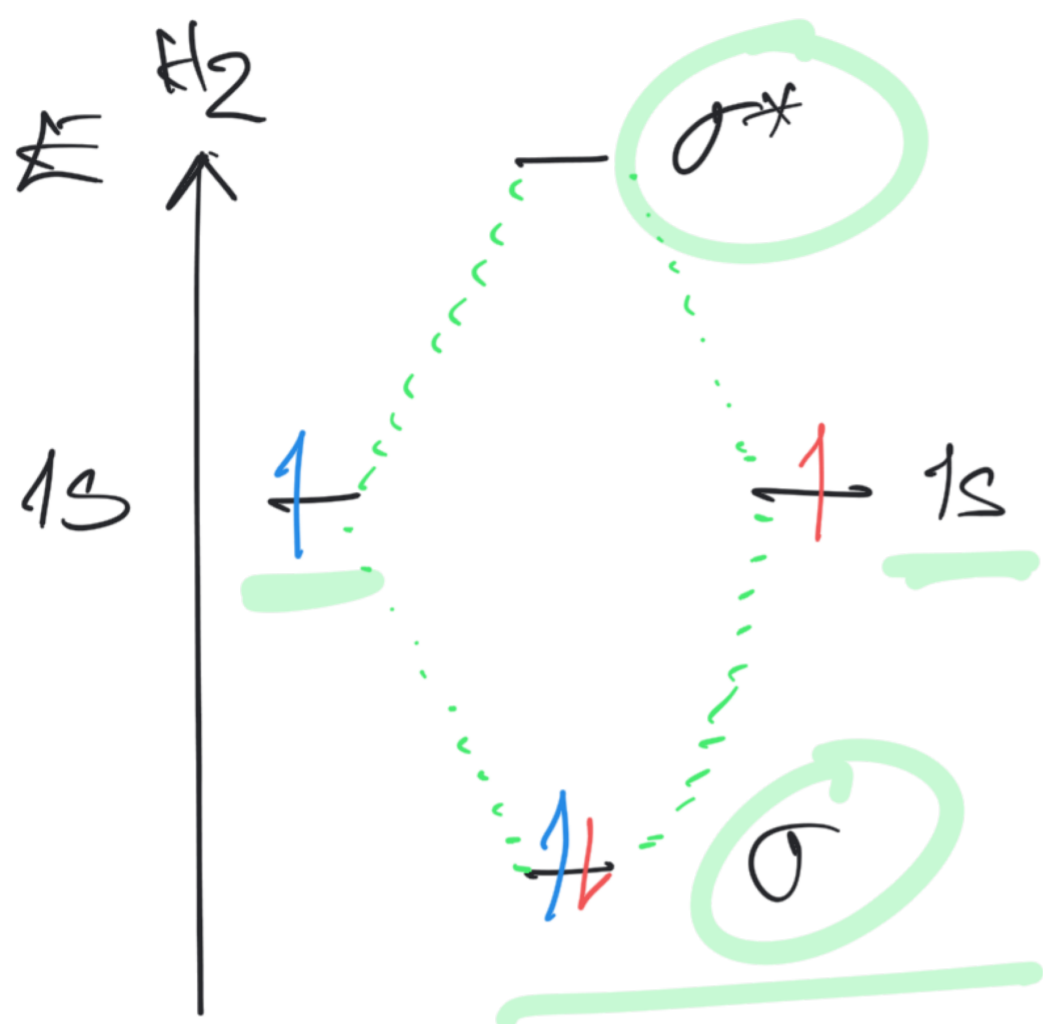


1. Tarkastele molekyylejä H<sub>2</sub> ja He<sub>2</sub>. Ovatko ne stabiileja? Entä kationi He<sub>2</sub><sup>+</sup>?

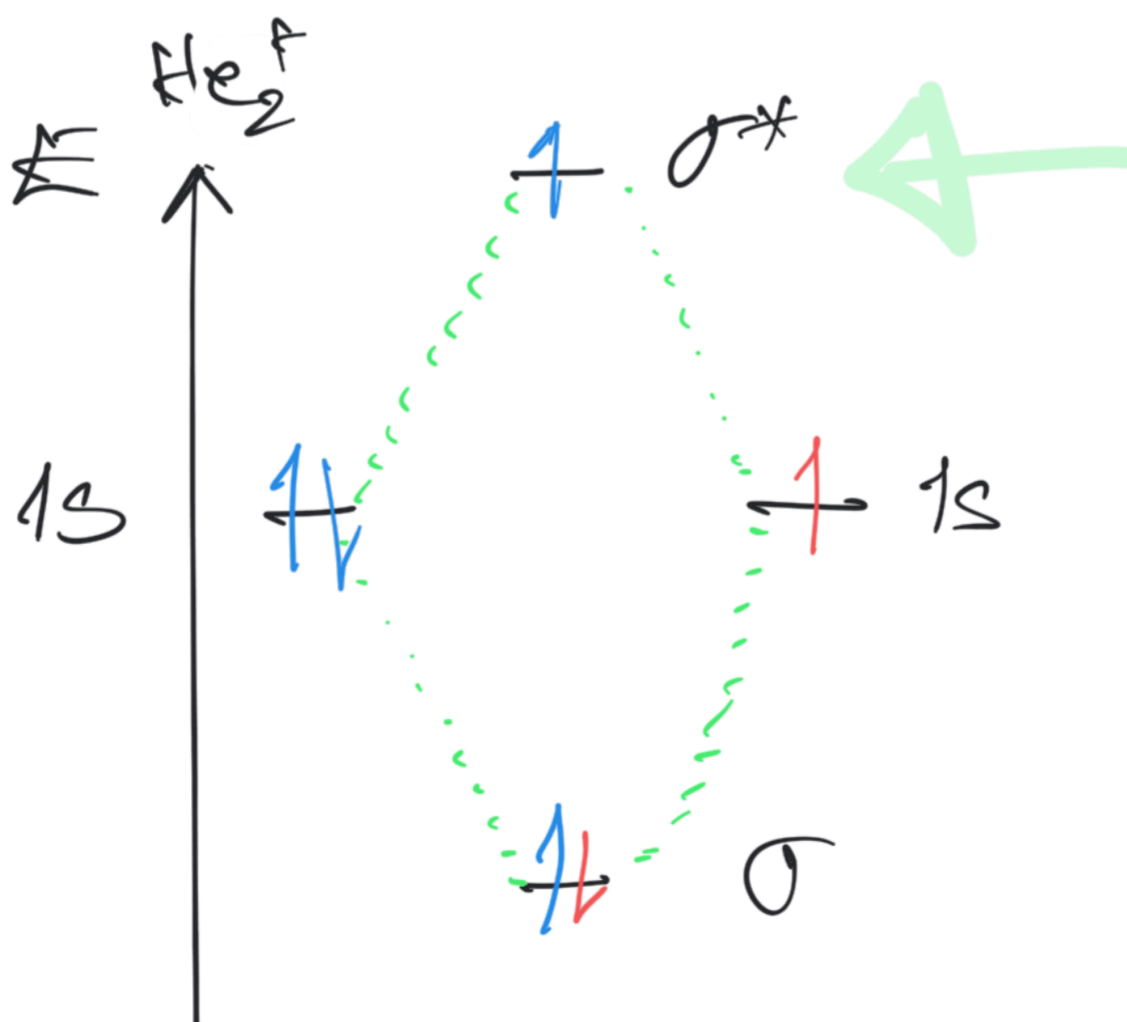


Energia sitovalla molekyyliorbitaalilla alempi kuin atomien 1s atomiorbitaaleilla.  
=> molekyyli pysyvä.

$$2E(\sigma) < 2E(1s)$$

Sitova ja hajottava täysin miehitetyt => ei energiavoittoa; ei pysyvä.

$$2E(\sigma) + 2E(\sigma^*) = 4E(1s)$$



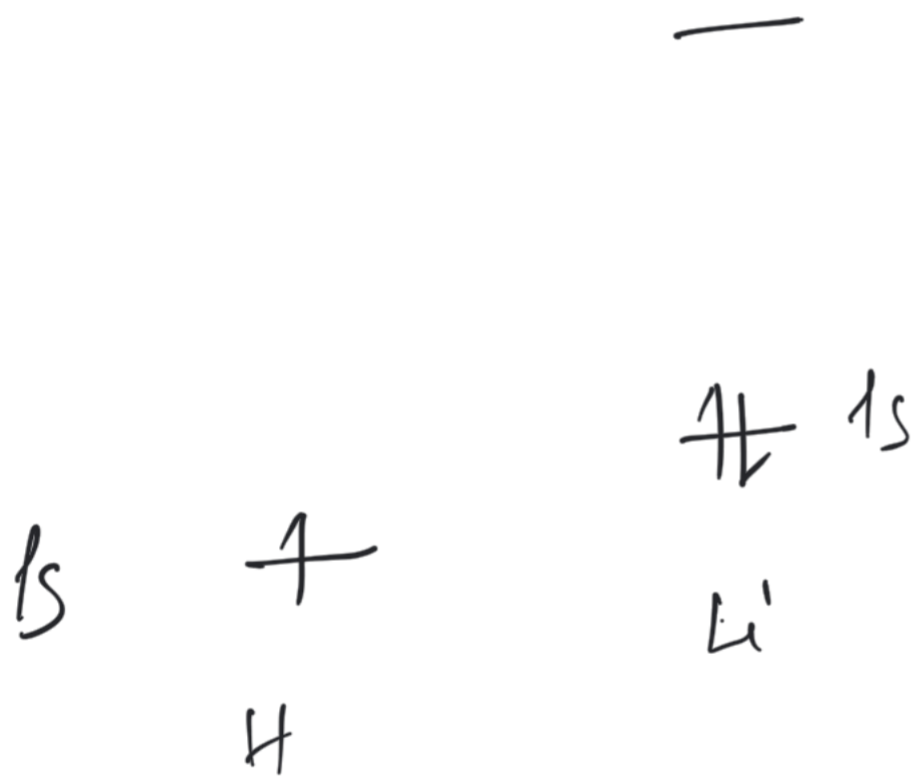
$$2E(\sigma) + E(\sigma^*) < 3E(1s) \Rightarrow \text{PYSYVÄ!}$$

2. Piirrä molekyyliorbitaali-kaavio yhdisteelle LiH. Millainen sidos atomien välillä on?

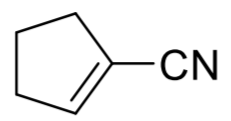
Vedyllä 1 elektroni :  $1s^1$

Litiumilla 3 elektronia :  $1s^2 2s^1$

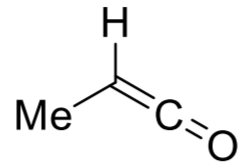
Litium on elektronegatiivisempi kuin vety, eli sen  $2s$  orbitaali on korkeammalla energialla kuin vedyn  $1s$  orbitaali.



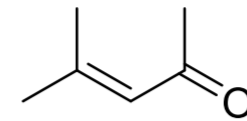
3. Mitkä ovat seuraavien yhdisteiden hiiliatomien hybridisaatiot ja geometriat?



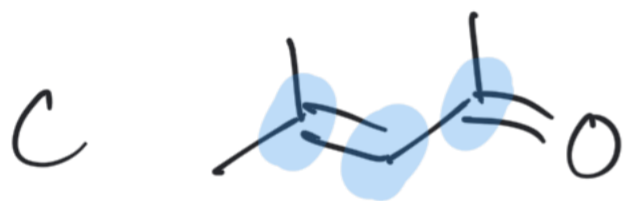
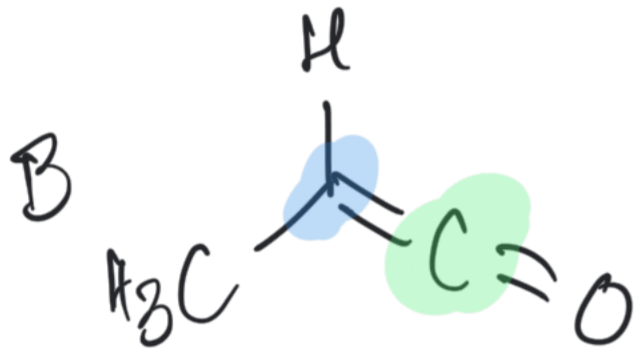
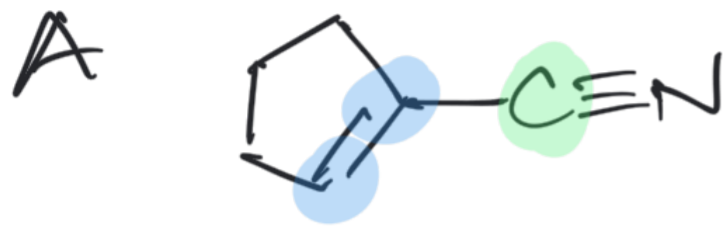
A



B

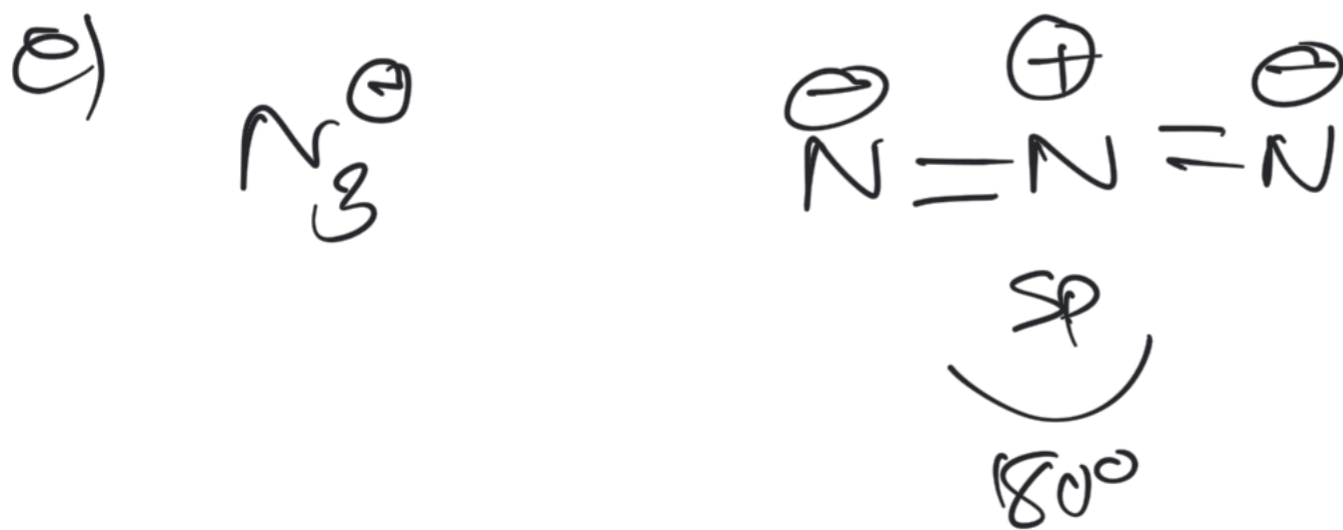
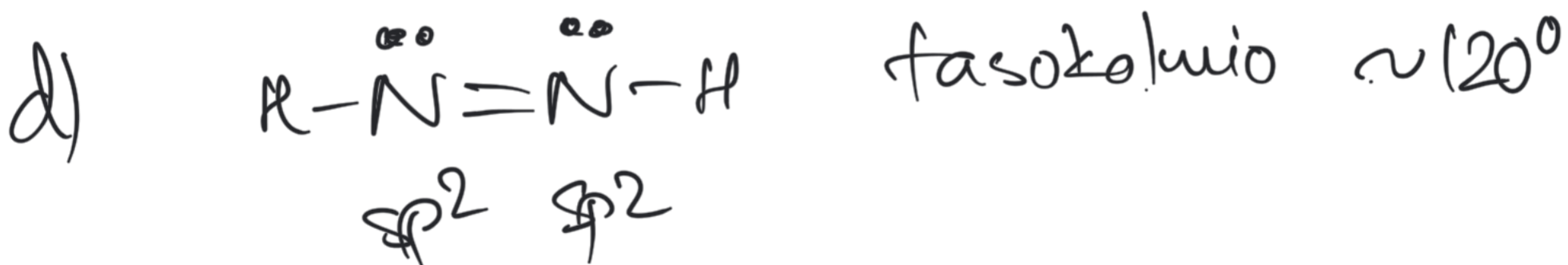
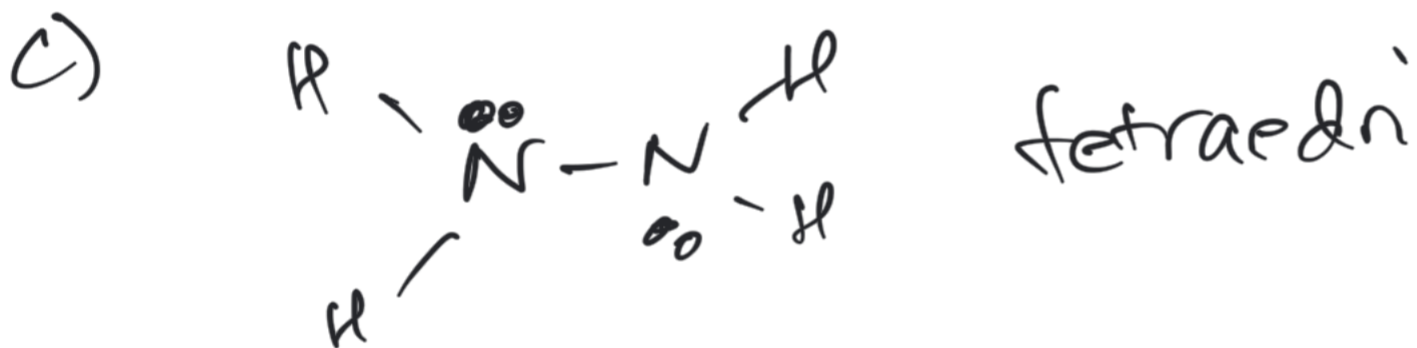
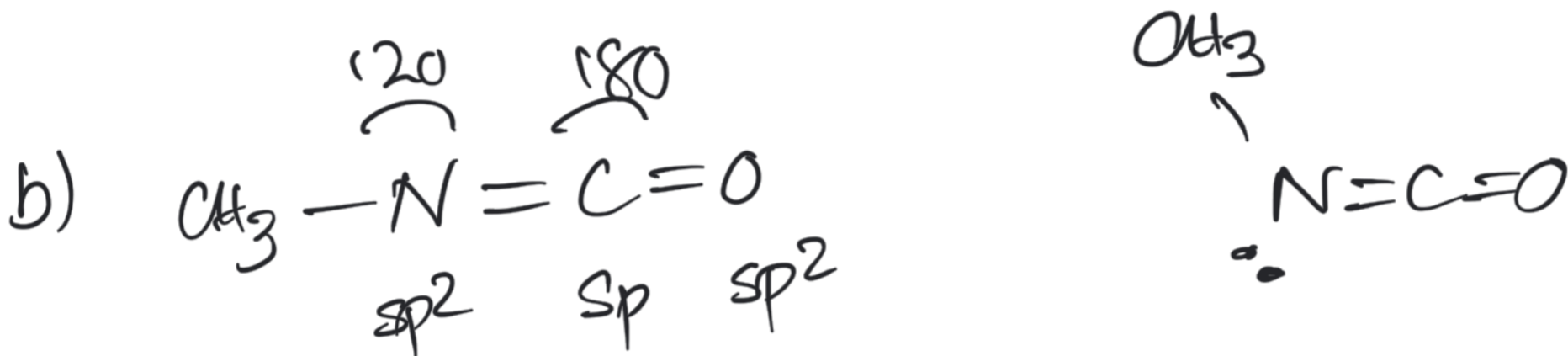
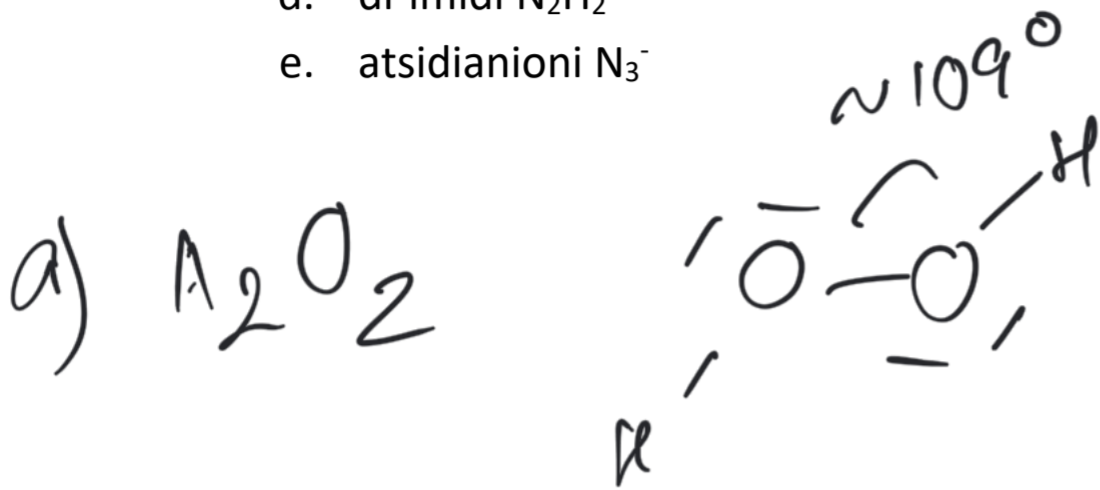


C



4. Mitkä ovat seuraavien molekyylien geometriat? Arvioi siduskulmat.

- vetyperoksidi  $\text{H}_2\text{O}_2$
- metyyli-isosyanaatti  $\text{CH}_3\text{NCO}$
- hydratsiini  $\text{NH}_2\text{NH}_2$
- di-imidi  $\text{N}_2\text{H}_2$
- atsidianioni  $\text{N}_3^-$



5. Missä ovat seuraavien yhdisteiden vapaat elektroniparit?

- vesi
- asetoni ( $\text{Me}_2\text{C}=\text{O}$ )
- typpi  $\text{N}_2$

