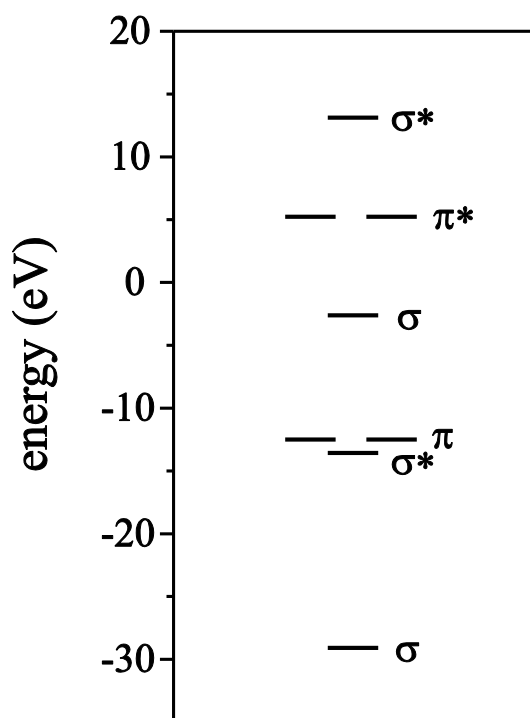


**Marks**  
**5**

- $C_2$  is a reaction intermediate observed in flames, comets and circumstellar shells.

How many valence electrons are there in  $C_2$ ?

Complete the calculated MO diagram for the ground state of  $C_2$  by inserting the appropriate number of valence electrons into the appropriate orbitals.



What is the bond order of  $C_2$ ?

What is the longest wavelength of light that the ground state  $C_2^+$  ion will absorb?  
Show working.

Answer: