

Molecular orbital theory – Exercises

1. The bond dissociation energy of H_2 is 436 kJ/mol is less than the double of that of H_2^+ is 256 kJ/mol. Explain why.
2. Use MO theory to determine the bond order and number of unpaired electrons in (a) O_2^- , (b) O_2^+ and (c) O_2^{2-} . Which of these species is paramagnetic?
3. Using the Hückel method, describe the geometry and the electronic structure of $\text{H}_2\text{C}=\text{O}$.
4. Use a qualitative molecular orbital energy-level diagram to describe the bonding in the hypochlorite ion. What is the bond order?