Worksheet 3.2
Molecular Orbital Theory

We are going to explore why hydrogen can form bonds and helium cannot form bonds.

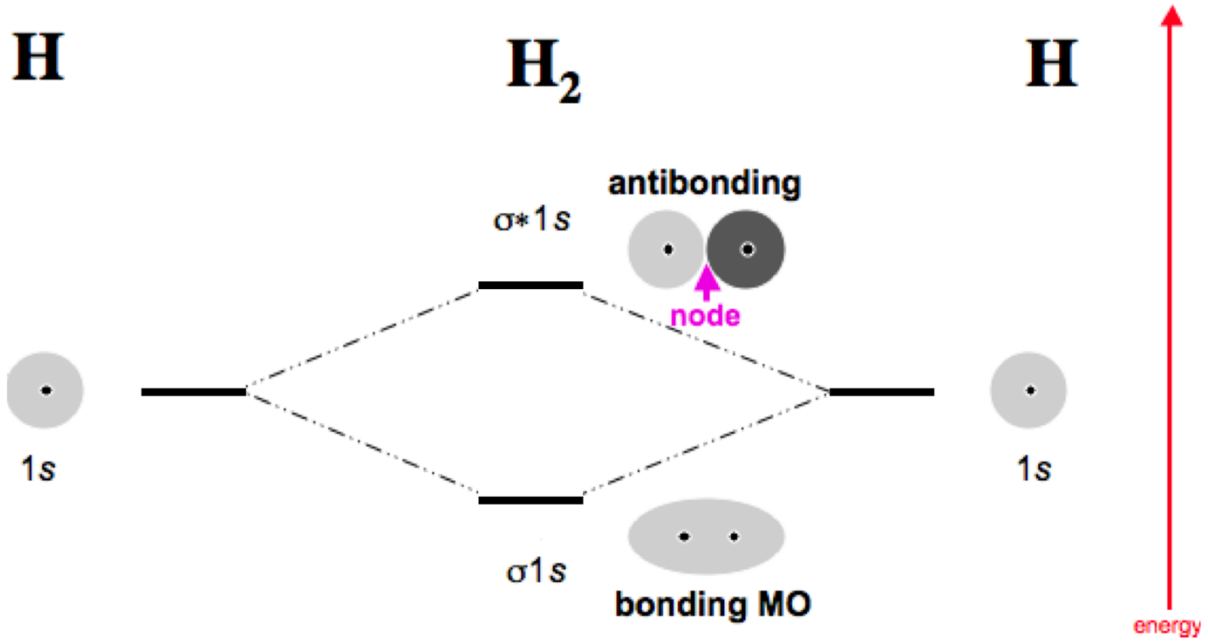
Hydrogen

1. What is the electron configuration for hydrogen?

2. How many core electrons and valence electrons does hydrogen have?

3. If two hydrogen atoms come together how many electrons total would be present?

4. Using your understanding of energy and atomic orbitals, predict where the electrons for hydrogen would be located for the molecular orbital diagram below.



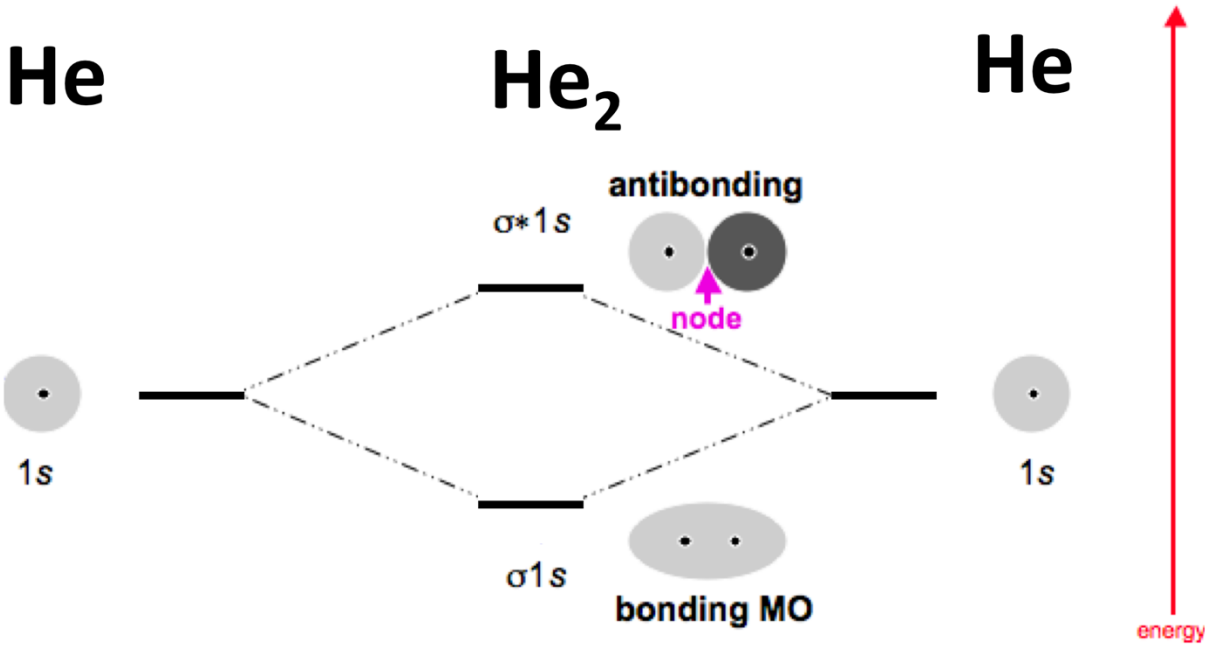
Helium

5. What is the electron configuration for helium?

6. How many core electrons and valence electrons does helium have?

7. If two helium atoms come together how many electrons total would be present?

8. Using your understanding of energy and atomic orbitals, predict where the electrons for helium would be located for the molecular orbital diagram below.



9. Now compare your molecular orbital diagrams for hydrogen and helium and explain why two hydrogen atoms can form a covalent bond between themselves, while two helium atoms cannot form a covalent bond between themselves.