

1. What is the process of protein formation, from DNA?
DNA (gene) -> mRNA -> Protein (polymer of amino acids)
2. Define atomic orbital
Region of space in which electrons mostly reside
3. The plane between the 2 nodes of a p-orbital
Nodal plane
4. When 2 out of phase waves are added together, what happens?
Cancel out
5. Bonding leads to what electron configuration?
Electron octet; noble gas configuration
6. Define covalent bond
2 electrons shared in 2 overlapping orbitals, from 2 atoms with orbitals of similar energy
7. Describe the structure of methane
Tetrahedral
All bonds the same length
All bonds the same angle
8. Why does carbon have 2 types of C-H bond?
2 kinds of orbital (2s, 2p), so 2 types of C-H bond
1 electron promoted from 2s orbital to spare p orbital (energy for this process is regained when 4 covalent bonds form)
9. Sp³ orbital features
Asymmetric about the nucleus
1 lobe larger than others, so overlaps better with the orbital from the other atom in the covalent bond
Form stronger bonds than an unhybridised s or p orbital
10. which elements can form sp³ orbitals?
Carbon, nitrogen, oxygen
11. hybridised orbitals are formed of...
A combination of individual orbitals (overall number is maintained)
12. molecular orbitals are formed of
Combination of atomic orbitals of similar energy in a molecule (bonding / antibonding)
13. what shape do sp³ orbitals always take
tetrahedral
14. what type of bond forms from the overlap of orbitals along the nuclear plane
sigma
15. t/f: hybridised orbitals form from the combination of individual orbitals
true
16. t/f: number of orbitals is not maintained during hybridisation
false
17. t/f: bonds with pure atomic orbitals are more stable than hybridised bonds
false
18. define ionic bond
Electron transferred from 1 atom to another, creating an electrostatic interaction, holding the atoms together
19. how many covalent bonds does carbon form
4
20. how many unpaired electrons does carbon have in its ground state?
2