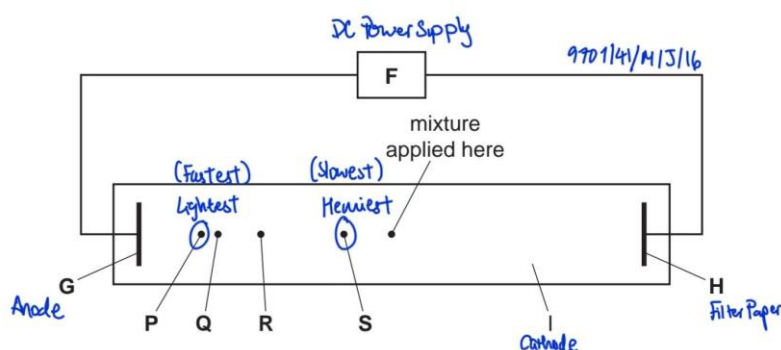


Organic Chemistry Most / Important / hard Common Questions

- State and explain the relative acidities of ethanol and phenol
 - Phenol is more acidic than ethanol because the O-H bond is weakened
 - The phenoxide ion is stable
 - Ethanol has an electron donating group / lone pair of electrons on oxygen can be delocalised or overlapped with ring
- How does the basicity of phenylamine compare to that of ethylamine?
 - Phenylamine is less basic than ethylamine
 - The lone pair of electrons on Nitrogen is delocalised over the ring
 - Making it less available for reaction with proton
- Electrophoresis



- Compare the basicities of ethylamine and ammonia
 - Ethylamine is more basic than ammonia
 - due to its electron donating ethyl groups
 - which make the lone pair on Nitrogen more available to accept a proton as a donation
- Write an equation showing why aqueous solution of ethylamine are alkaline
 - $\text{CH}_3\text{CH}_2\text{NH}_2 + \text{H}_2\text{O} \rightarrow \text{CH}_3\text{CH}_2\text{NH}_3^+ + \text{OH}^-$
- Explain the principles of the separation of amino acids by electrophoresis
 - Direction of movement related to charge of amino acid
 - Distance travelled is related to the Mr of the amino acid
- State what is meant by chiral centre
 - Carbon surrounded by 4 different groups
- Suggest why a molecule may be insoluble in water
 - Non-polar
- Compare the relative basicities of ammonia, phenylamine and $\text{C}_{10}\text{H}_{13}\text{NH}_2$ (=H)
 - H has more electron donating alkyl groups, Hence it makes lone pairs more available to accept a donation

- This makes H more basic
 - The N in phenylamine is delocalised over the ring, hence it is less basic than Ammonia
10. According to your drawn mechanism in the part before, predict whether the product will be a single optical isomer or a mixture of two optical isomers
- IF Sn1: A mixture of two optical isomers will be formed
 - AND the intermediate can be formed by the X^- approaching from the top or bottom of the plane
 - IF Sn2: one optical isomer will be formed since the attack is always from a fixed direction
11. Write the equation for the reaction between HNO_3 and H_2SO_4 that forms an electrophile
- $HNO_3 + 2H_2SO_4 \rightarrow H_3O^+ + NO_2^+ + 2HSO_4^-$
12. Describe how the structure and bonding of the six-membered ring in an intermediate differs from methylbenzene
- In the intermediate the bonds are partially delocalised
 - Methyl benzene has 2 more pi electrons
 - The intermediate contains sp^3 hybridization
 - The intermediate has an angle of 107 degrees and is tetrahedral
13. Suggest how the basicity of benzocaine would compare to that of ethylamine
- Ethylamine is more basic
 - Lone pair of N is more available to accept protons
 - Since ethyl is an electron donating group
14. Explain why no addition reaction takes place
- The Substitution product is stabilised by delocalisation of 6 pi electrons

POLYMERISATION

15. Give an example of a synthetic polyester and synthetic polyamide
- Polyester: Terylene
 - Polyamide: Kevlar/ nylon
16. Give the name of the molecule which is usually discarded in condensation polymerisation reaction
- Water
 - HCl
17. Polypeptides contain a high proportion of carbon and hydrogen in their structures, yet many are soluble in water. By referring to the structure of a polypeptide, explain why:
- Hydrogen bonds between the oxygen and nitrogen groups
 - Ion dipole-dipole attractions between the NH_3^+ and CO_2^-
18. Suggest the sign of the entropy change for addition polymerisation
- Entropy will be negative

- Many gas molecules are combined to form one large molecule

19. Suggest the sign of entropy change for condensation polymerisation

- Entropy likely to be positive
- each pair of monomer molecules join to form a chain molecule
- two molecules of water form