

NAME

DEPT

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ENR/1/10

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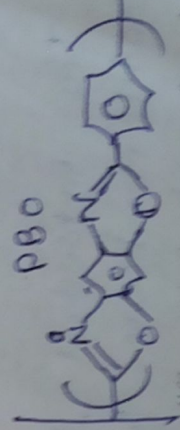
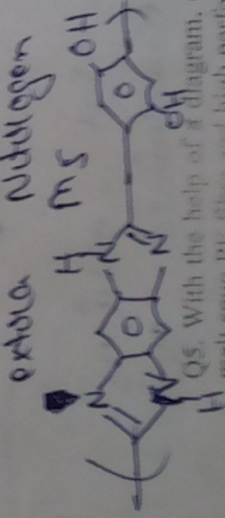
Q. Explain the following.

- As-spun thermotropic aromatic polyester fibres are not drawable but the properties of the fibres can be enhanced by heat treatment.
- The reason for difference in compressive properties of M5 fibre and PBO fibre.

a) The molecular weight of the TA polyester fibres becomes 3 times on heat treatment. Basically or applying the shear stress the viscosity of fibres is greatly reduced (linearly). So therefore on drawing with heat treatment at high temperature the orientation and crystallization. Increased to 20%.

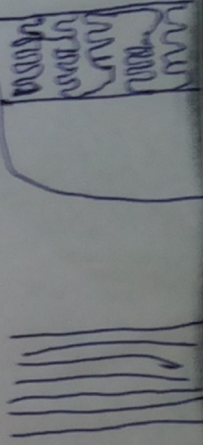
The tenacity becomes around 23.2 ~~2.2~~ g/dl like on increase the temperature mobility increases between the chains and there is intermolecular interaction between them so they easily orient.

b) The reason behind compressive properties is that the presence of hydrogen bonding present between the honeycomb structure PBO or M5 fibres. Due to whereas PBO fibre does not form any kind of hydrogen bond (Intermolecular) also compressive properties are weak. In M5 the hydrogen bonding is due to presence of ~~OH~~ (-OH) groups and extra nitrogen groups.



Q5. With the help of a diagram, explain what is the difference in the structure of conventional melt spun PE fibre and high performance PE fibre? Explain, the basic aspects for obtaining such a structure.

High performance Polyethylene



melt spun PE fibre (1+4=5 marks)



