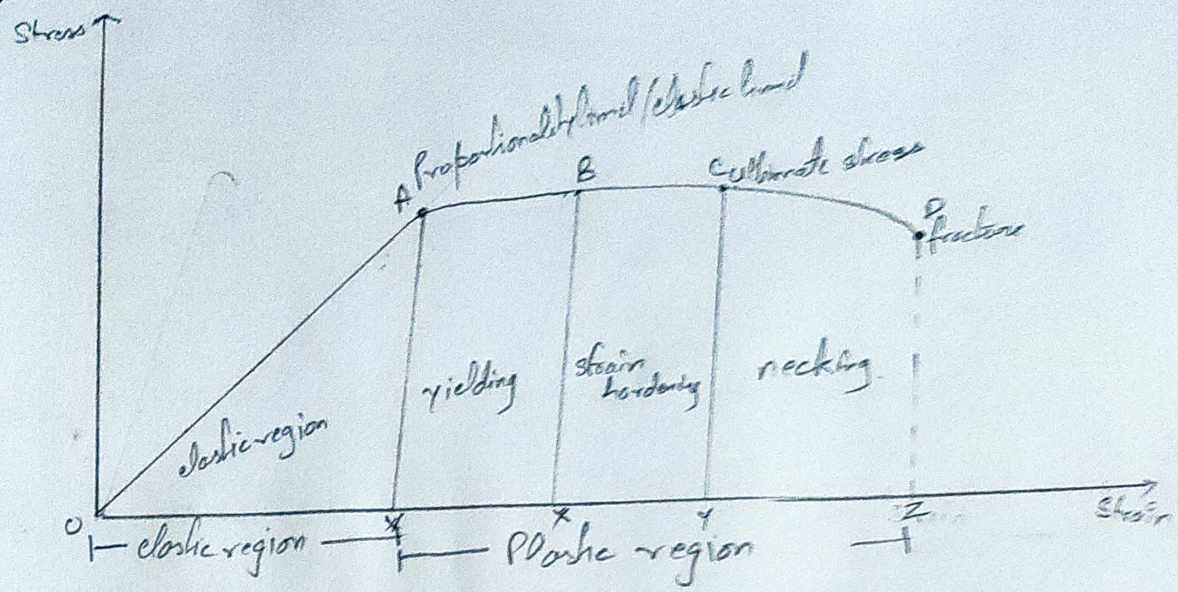
CT-3

1)



a) OAY is the elastic region under which metal can regain it original shape after removal of force.

2) A is elastic limit of stainless steel. Under increasing strain (faster than stress). Beta steel changes its change its shape.

3) BCYX is the region where steel is hardened in strain

4) C is the ultimate stress point.

5) After point C steel will become brittle at point D steel will be broken.

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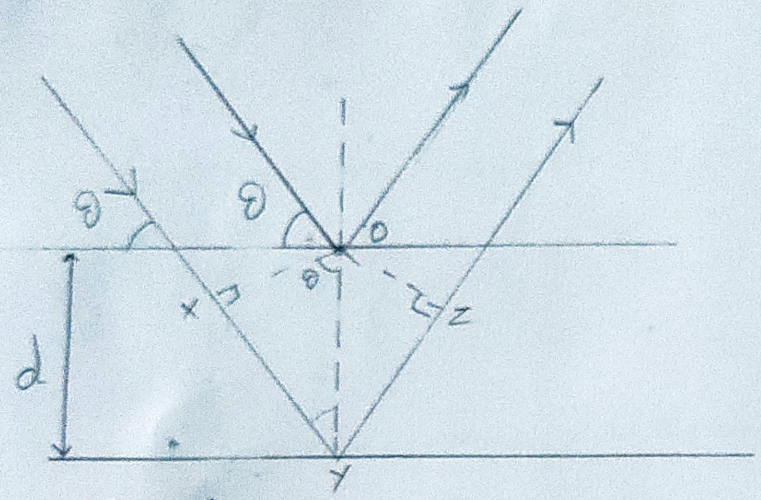
3) The Equation between distance between atomic layer and wavelength of radiation used is called Bragg's law

$$n\lambda = 2d \sin\theta$$

Derivation:-



Constructive interference occurs only when

$$n\lambda = XY + YZ$$

In triangle OXY;

$$\sin\theta = \frac{XY}{d}, \quad XY = d\sin\theta$$

similarly

$$YZ = d\sin\theta$$

$$\Rightarrow n\lambda = 2d\sin\theta$$

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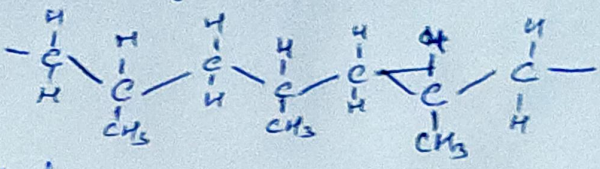
4) Isotactic

All the functional groups are arranged on the same side of main chain

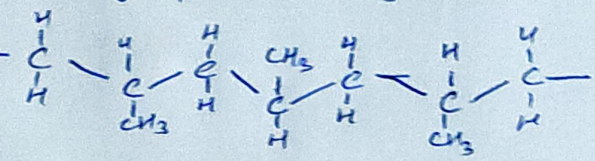
Eg:-



Syndiotactic

All the functional groups are arranged in the alternating manner.

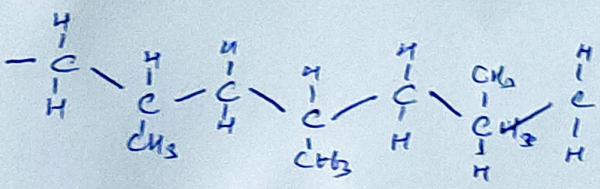
Eg :-



Atactic

All the functional groups are arranged in the random manner

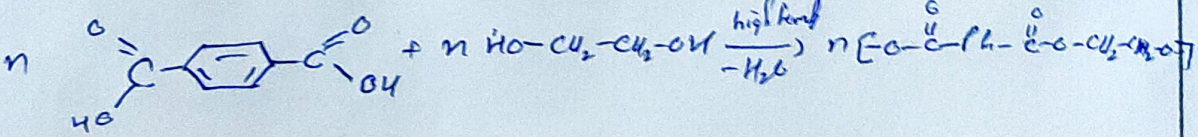
Eg:-



c)

a) PET

PET is produced by terephthalic acid is reacted with ethylene glycol at high temp.



Properties

- Very good heat resistence
- Low water absorption
- Resistance to chemicals.
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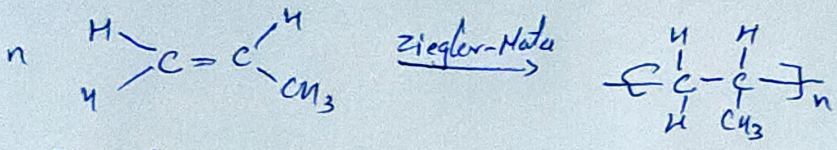
Applications

→ Packaging trays
→ bottles
→ food packaging applications

b) Polypropylene

It is made from propylene by Ziegler-Natta catalyst



Properties

- Resistance to acids
- Resistance for organic solvent
- Resistance to bleaching under 65°C

Applications

- manufacturing of mats, rugs & carpets
- used as insulation for electrical applications

7)

P- dopping

→ It is done by oxidation process

→ Polymer is treated with Lewis Acid

→ P-type dopants are oxidizing agent capable of removing electrons from valence band of polymer

N- dopping

→ It is done by reducing process

→ Polymer is treated with Lewis base

→ N-type dopants are reducing agents capable of adding electrons ~~from~~ its valence band of polymer