

25/03/2021

Engineering ChemistryPolymer - Tutorial 2

- 1) What is fabrication of plastics? List the methods of fabrication.

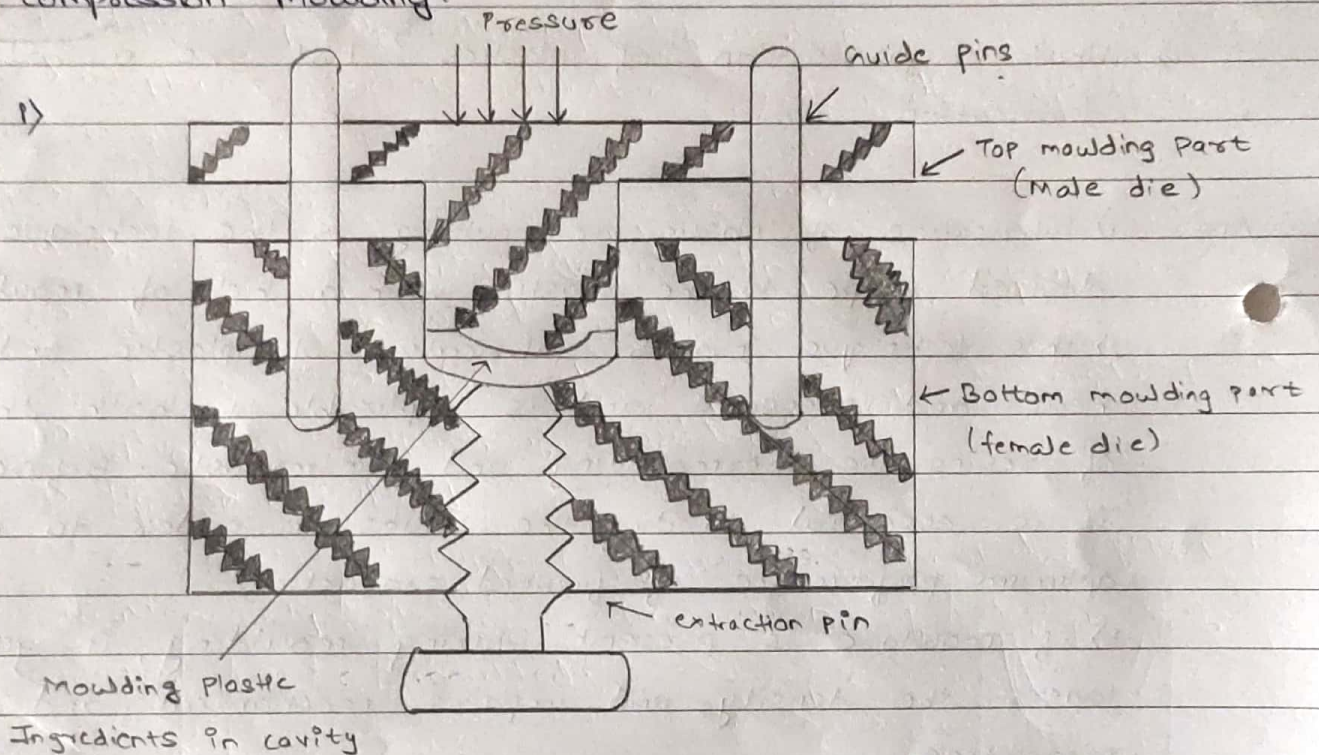
- Ans.
- i) Fabrication of plastic or moulding is the technique of giving desired shape to the plastic with a help of mould.
  - 2) This technique involves fabrication of plastic under severe heat and pressure and is applicable to both the type of resins i.e. thermosetting and thermoplastic. Before moulding, it is essential to dry the resins in order to achieve optimum performance of finished product.
  - 3) If moisture is present during moulding, it generally lowers the density and impairs mechanical and optical properties.
  - 4) The moulding process involves different techniques which are described below:
    - (A) Compression moulding.
    - (B) Injection moulding.
    - (C) Transfer Moulding.
    - (D) Extrusion Moulding.



- 2) With the help of neat and labeled diagram explain compression moulding.

Ans.

1)



1) This method is applicable to both thermoplastics and thermosetting resins.

2) In this method, a synthetic plastic material that has to be moulded is mixed with filler and other ingredients in proper proportions and then placed in the mould.

3) The mould is closed under low pressure. Then it is heated with simultaneous application of the pressure according to specifications. The cavities get filled with fluidized plastic.

4) Once the moulding is over, the material is withdrawn after cooling. Finally curing is done either by heating or cooling.

5) After this process is over, the moulded article is

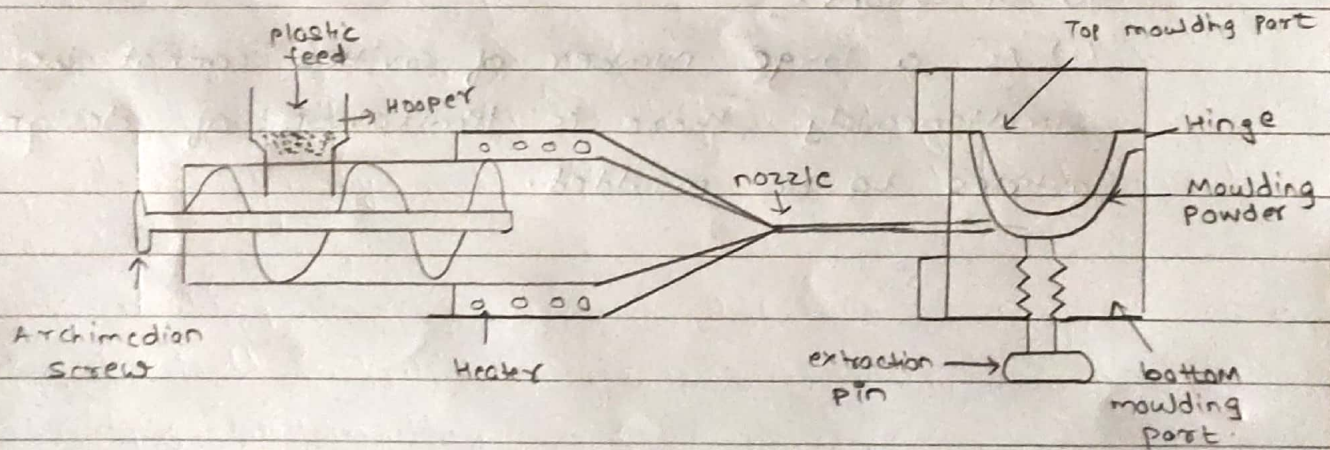


taken out by opening the mould parts. Currently fully automatic moulding presses are available to quicken the process.

e) Door handles, handles of electrical iron, bottle caps, screw caps are obtained by this method.

3) With the help of neat and labelled diagram explain injection moulding.

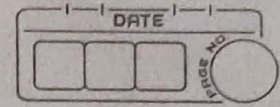
Ans



Injection Moulding.

- 1) This method is applicable to thermoplastic resins. The plastic in the form of powder is fed into a hot cylinder through hopper.
- 2) The hot softened plastic is forced at a controlled rate into a tightly locked mould by means of screw arrangement or piston.
- 3) The temperature at the nozzle is increased (between  $130^{\circ}$  -  $260^{\circ}\text{C}$ ) which makes plastic fluidized and is injected in the mould.





4) The mould is kept cooled to enable the hot plastic to be cured and become rigid. Moulded object is ejected mechanically without any deformation.

5) Telephones, buckets, dustbins are made by this technique.

6) Advantages:

(1) It is widely used for moulding of thermoplastics.

(2) It has high speed production.

(3) It has low finished cost.

(4) It has low loss of material.

7) Limitations:

(1) As a large number of cavities cannot be filled simultaneously, there is limitation of design of articles to be moulded.