



Dental Material

Acrylic resin

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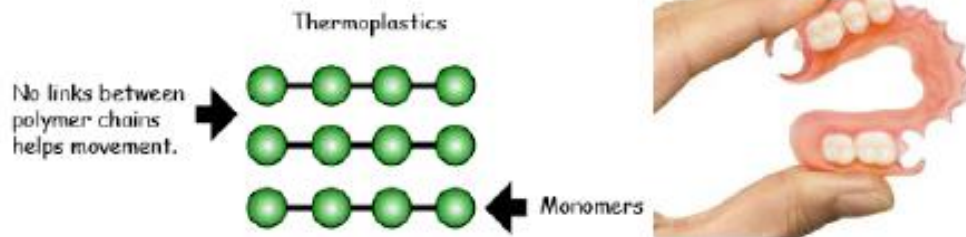
Dental material

Resin is defined as a highly viscous substance that can be converted to polymers. They are usually mixtures of organic compounds.

Classification of resins

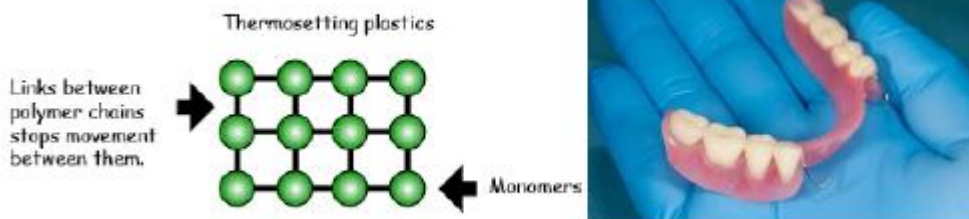
1. Thermoplastic resin

These are resins that can be repeatedly softened and molded under heat and pressure without any chemical change occurring. They are usually soluble in organic solvents. Most resins used in dentistry belong to this group, **e.g.** polymethyl methacrylate, polyvinyl acrylics and polystyrene.



2. Thermosetting

These resins can be molded only once. They set when heated. These cannot be softened by reheating like the thermoplastic resins. They are generally insoluble.



Uses of resins in dentistry

1. Fabrication of dentures (denture base resins).
2. Artificial teeth.
3. Tooth restoration, e.g. fillings (composite resins).
4. Orthodontic
5. Provisional restorations in fixed prosthodontics



Acrylic resins (Denture base resin material)

Known as polymethylmethacrylate (PMMA) These are widely used in dentistry to fabricate various appliances because it is easy to process and use, cheap and good esthetic. the polymer (powder) is mixed with the liquid (monomer) to produce a dough-like consistency which is easily molded.



The ideal requirements of denture base material:

Dental resins, both restorative and denture base should be:

1. tasteless, odorless, nontoxic and nonirritant to the oral tissues.
2. Natural appearance.
3. dimensionally stable.
4. Have enough strength, resilience and abrasion resistance.
5. Insoluble in saliva or other fluids.
6. Have a low specific gravity (light in weight).
7. Be easy to fabricate and repair.
8. Have good thermal conductivity.
9. Be radiopaque.
10. Inexpensive.

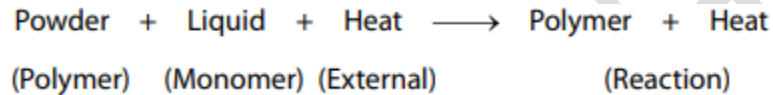
Types of resins (Based on the method used for its activation)

1. Heat activated resins
2. Chemically activated resins
3. Light activated resins

Heat activated denture base acrylic resin

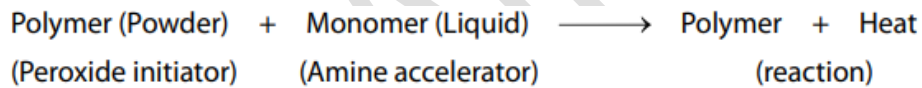
Heat activated polymethyl methacrylate resins are the most widely used resins for the fabrication of complete dentures.

- Polymerization is achieved by application of heat and pressure.



Chemically activated denture base acrylic resin

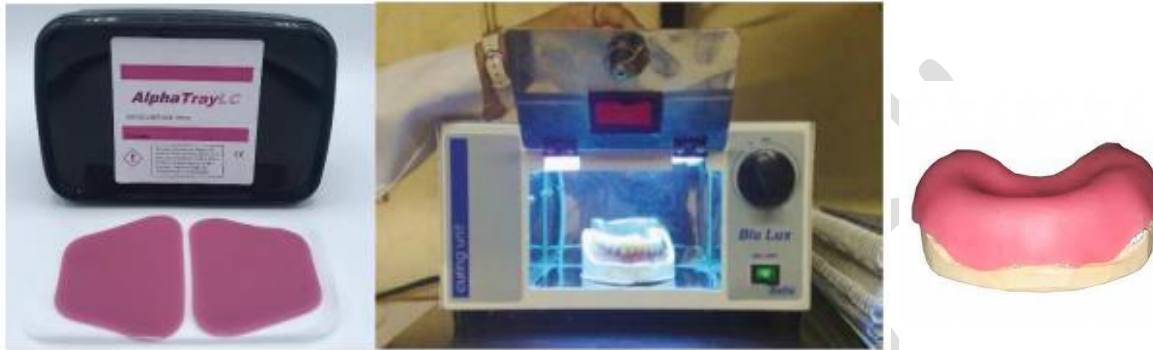
The chemically activated acrylic resins polymerize at room temperature. They are also known as 'self-curing', 'cold-cure' or 'auto-polymerizing' resins.



Cold cure	Heat cure
Heat is not necessary for curing	Heat is necessary for curing
Porosity is greater	Porosity of material is less
Has lower molecular weights	Higher molecular weights
Higher residual monomer content	Lower residual monomer content
Material is weaker	Material is stronger
Poor color stability	Color stability is good
Shorter working time	Longer working time

Light activated denture base acrylic resin

It is supplied in sheets having a clay like consistency and provided in light proof packages to avoid premature polymerization. It is polymerized in a light chamber (curing unit)



Thermoplastic polymer (flexible dentures)

Thermoplastic resins are used for the fabrication of flexible denture. A thermoplastic is a plastic which becomes moldable above a specific temperature and returns to a solid state when cooled.

Uses of flexible dentures:

1. Partial and complete denture when we have undercut
2. Tilted teeth.
3. Patient allergy to acrylic monomer
4. patient allergic to nickel.
5. When we need high esthetic.

