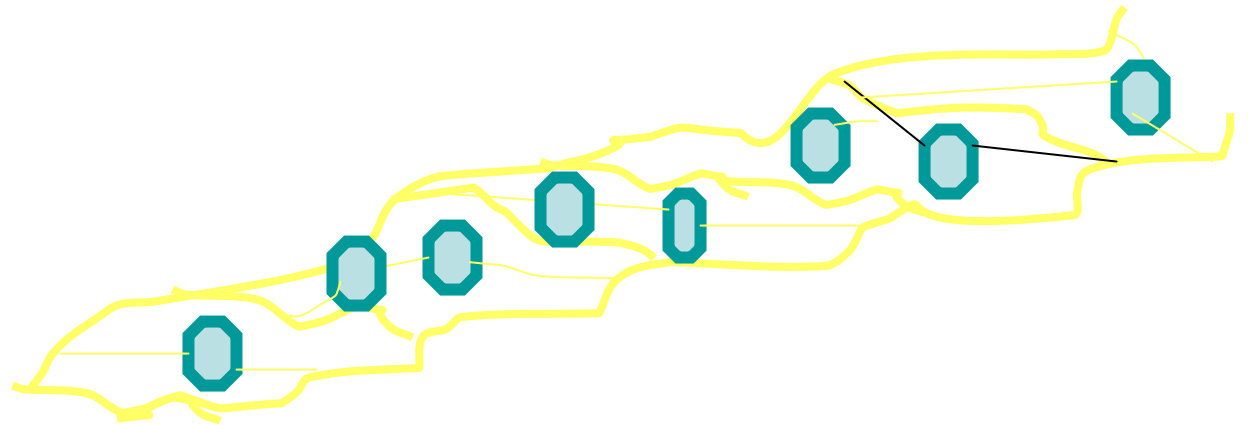


Composites

Chemically bonded mixture of organic matrix (resin) and inorganic filler



Composition

- **Organic phase - resin**

Bowen's monomer – bisphenol A a
glycidylmetacrylate– Bis GMA

Other dimetacrylate

UDMA

TEGMA

3

Composition

- **Inorganic phase - filler**

Milled qua

Baryumaluminium glass

Silica

Prepolymer

4

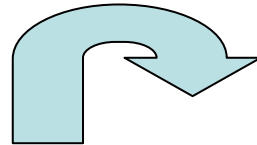
Composition

- Initiatory system
initiator a activator
- Stabilizers
- Pigments
- UV absorbers
- Antioxidants

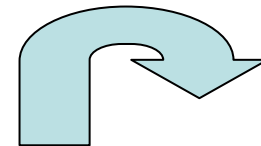
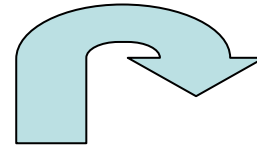
5 Curing of composites

Polymerization
Activator

Iniciator



Splitting of double bonds
Creation of the
polymer network



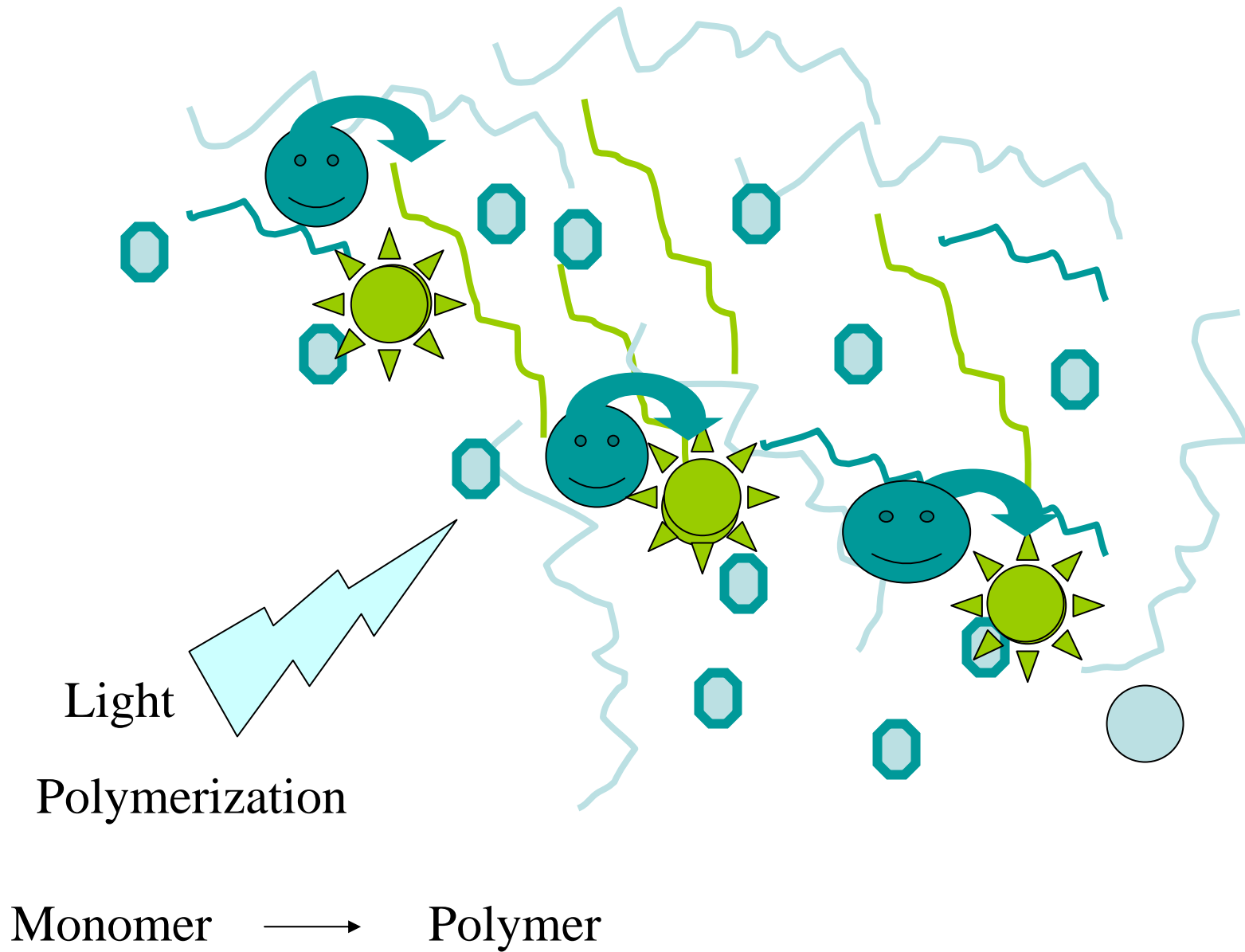
Composite according to mode of curing

 Chemically curing

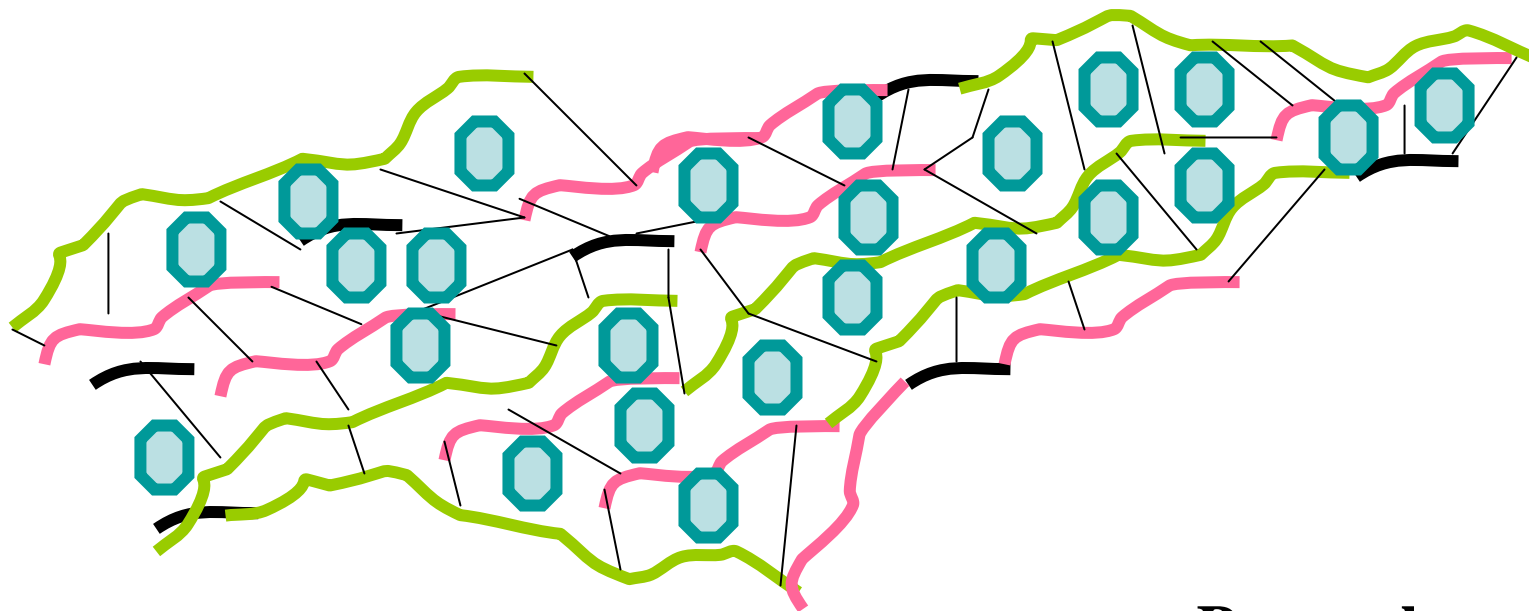
 Light curing

 Dual curing

 Warm curing



Polymer network

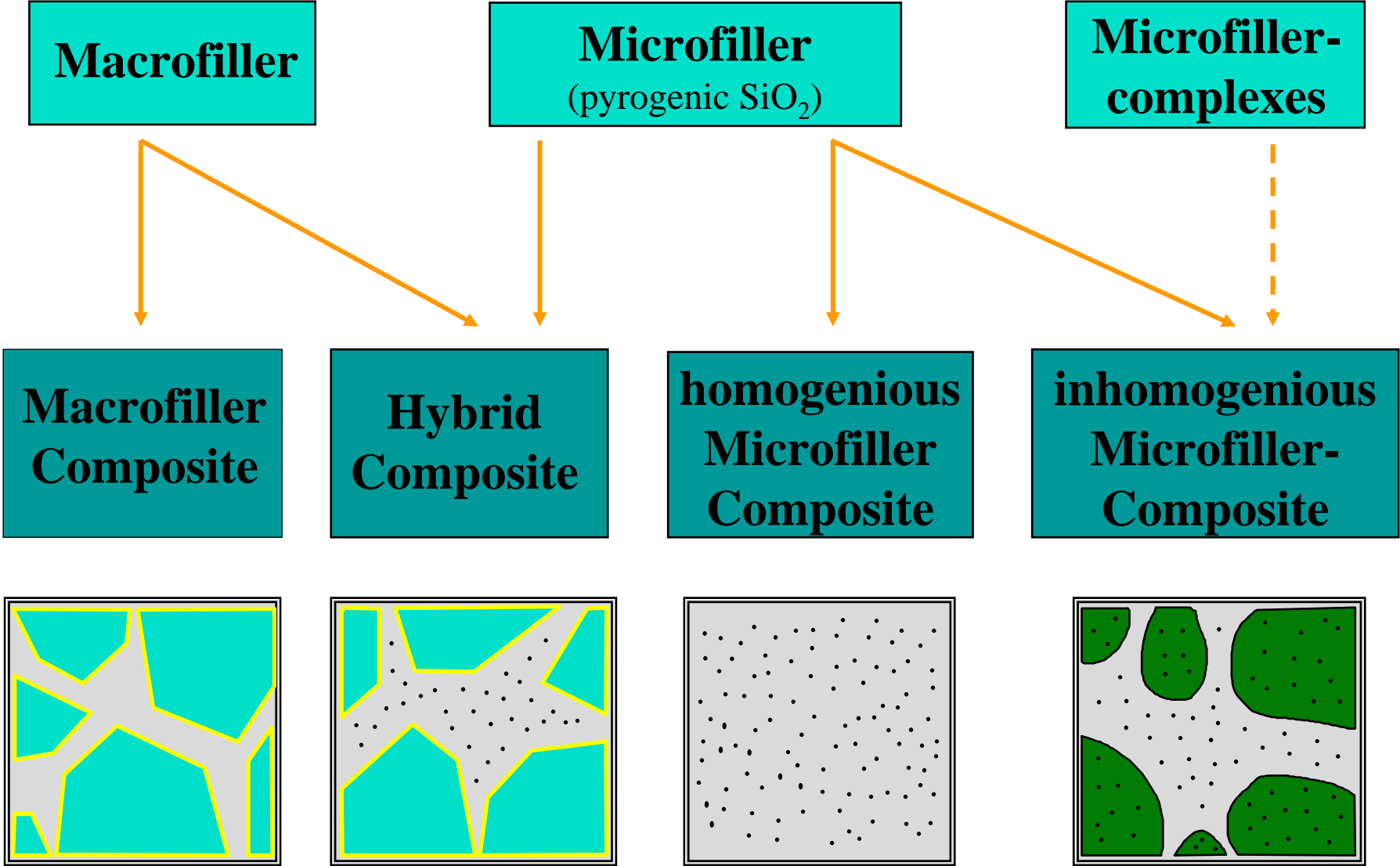


Polymerization shrinkage

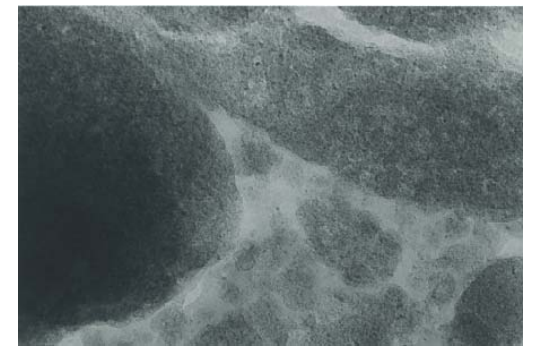
Pre -gel
G-point
Post -gel

Classification according to type of fillers

(Phillips & Lutz 1984)



Filler particles



Filler size (medium particle size)	Composite category
< 10 μm	hybrid composite
< 5 μm	fine particle hybrid
< 3 μm	ultrafine particle hybrid
< 1 μm	submicron hybrid

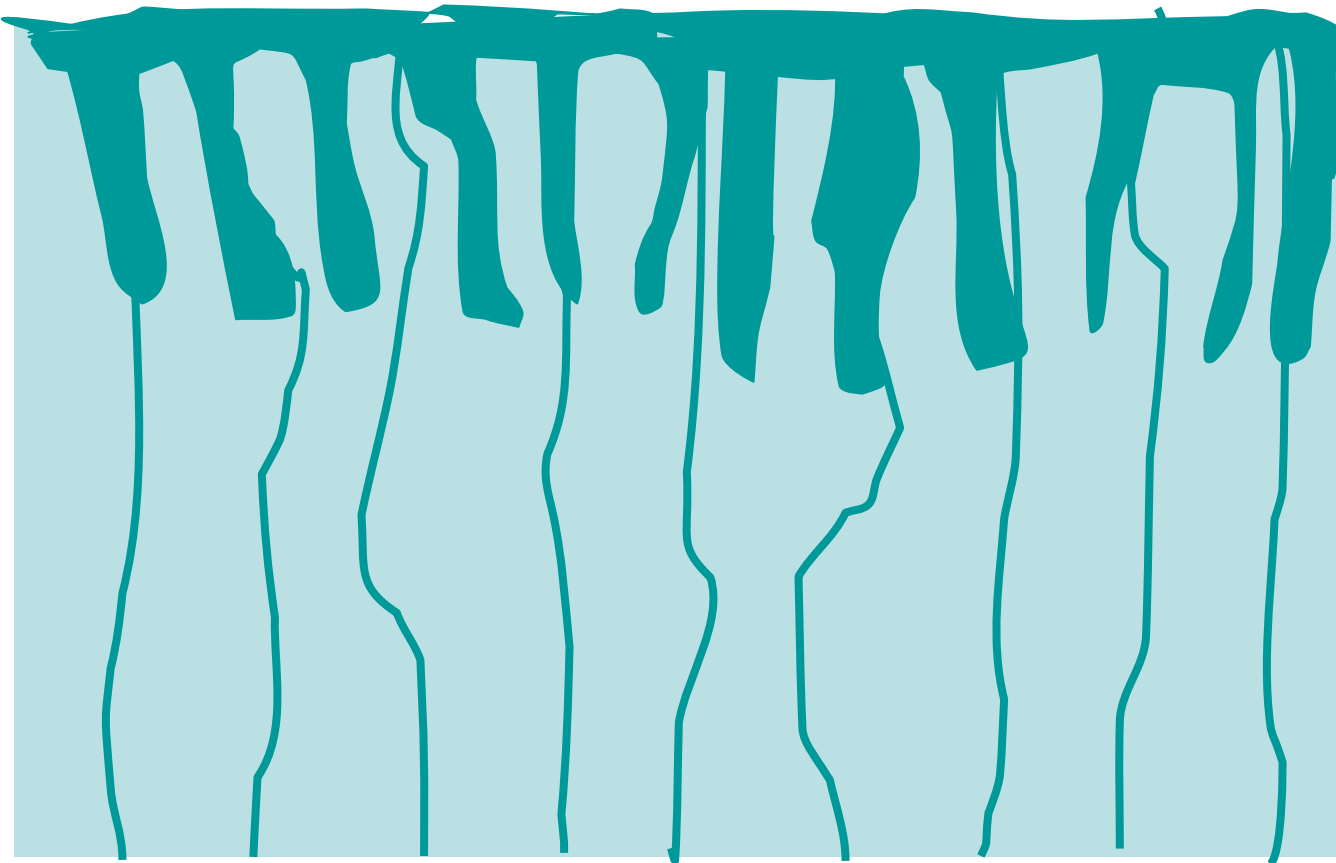
Use of Composites

- **Aesthetic restorations**
- **- class III., IV., V., I., II.**

Bonding to the tooth structures

Enamel

Ablation of
the aprismatic enamel
Acid etching



Dentin

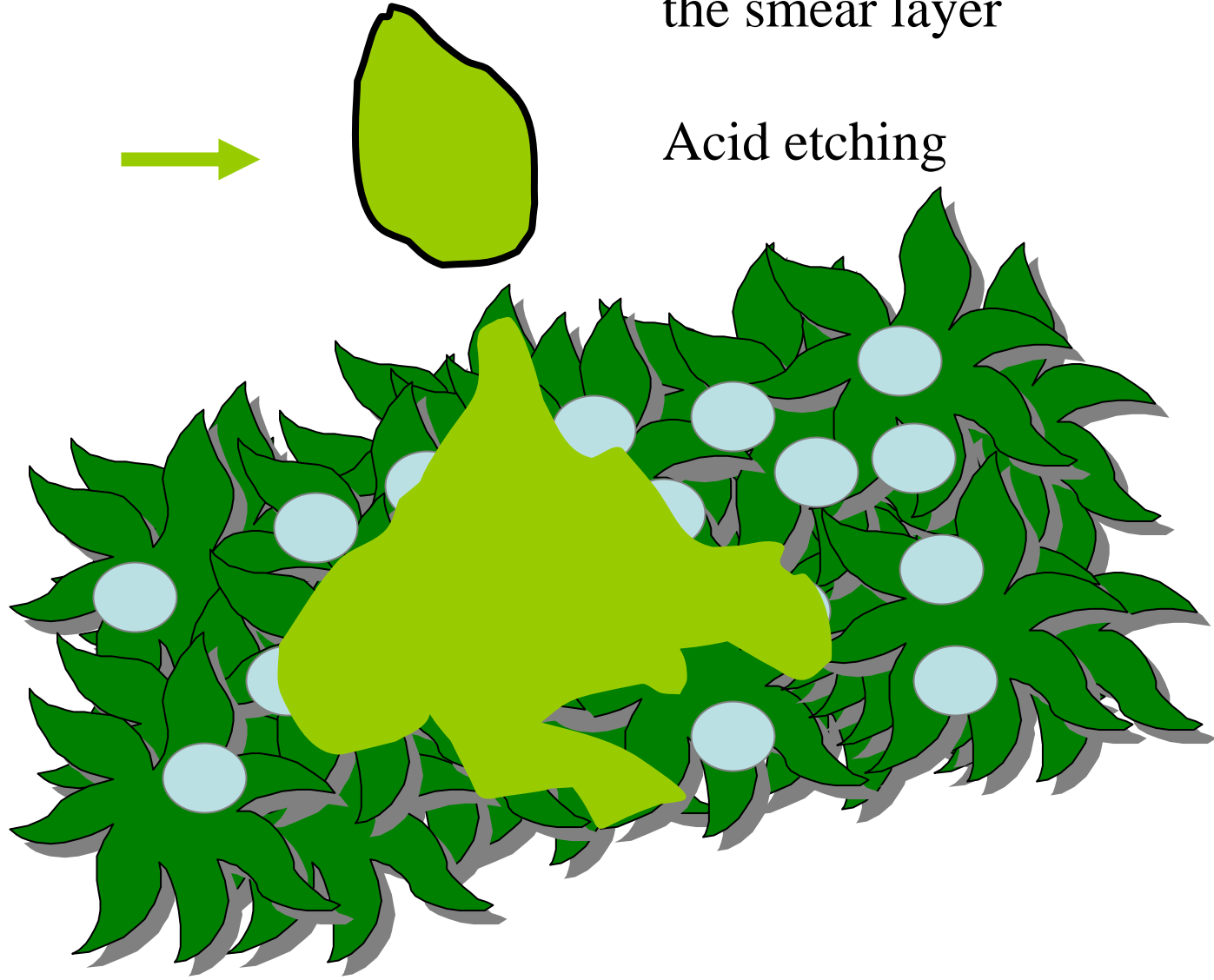
- o More water and organic substances
- o Low surface energy
- o Tubular liquid
- o Communication with the pulp chamber
- o Smear layer

Bonding to the tooth structures

Dentin

Removing of
the smear layer

Acid etching



Konditioner

Demineralization

Increase of the surface energy

Phosphoric acid

Primer

**Opening og the collagen network of
dentin**

Bond

- **Penetrates into the retentive pattern in enamel and the collagen network of dentin (hybrid layer)**

Glasionomer cements

- **Composition**

Powder: aluminumsilicate glass

Tekutina:

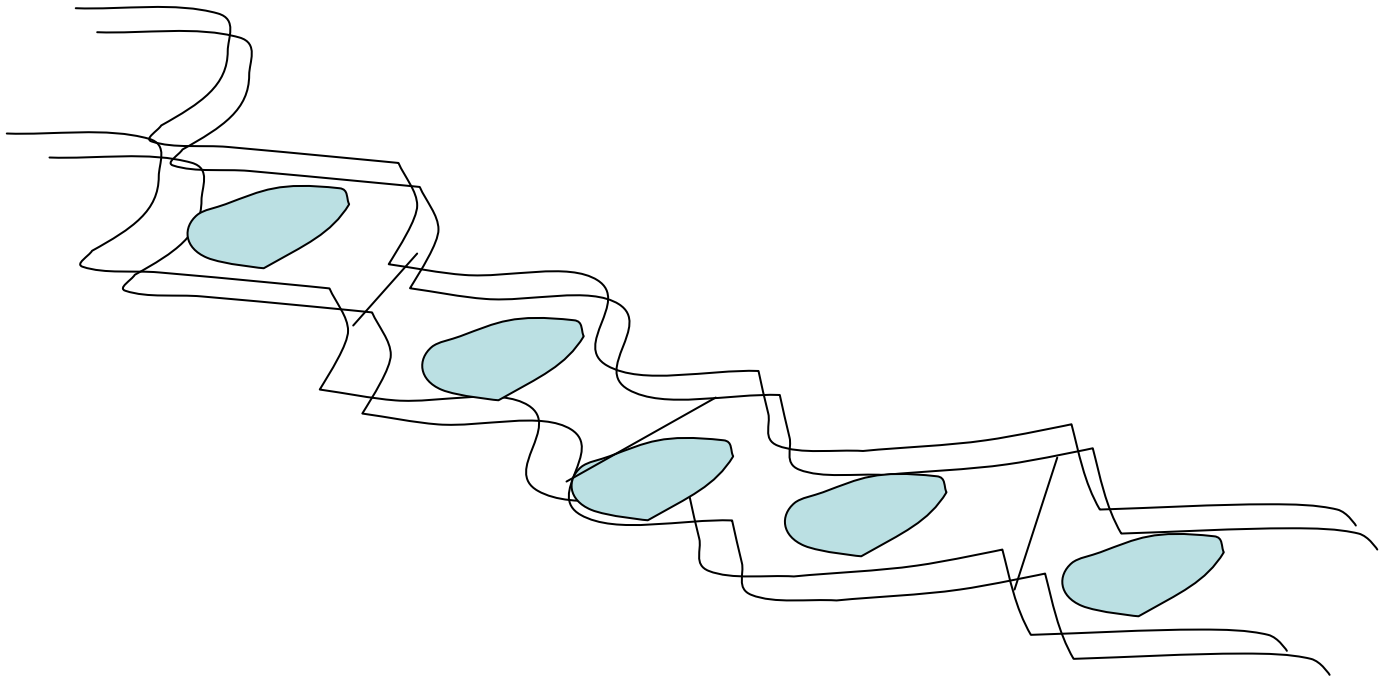
Polyacrylic acid or polymaleic acid

Tartaric acid

Water

Curing of GIC

- Aluminium calcium polyacrylate

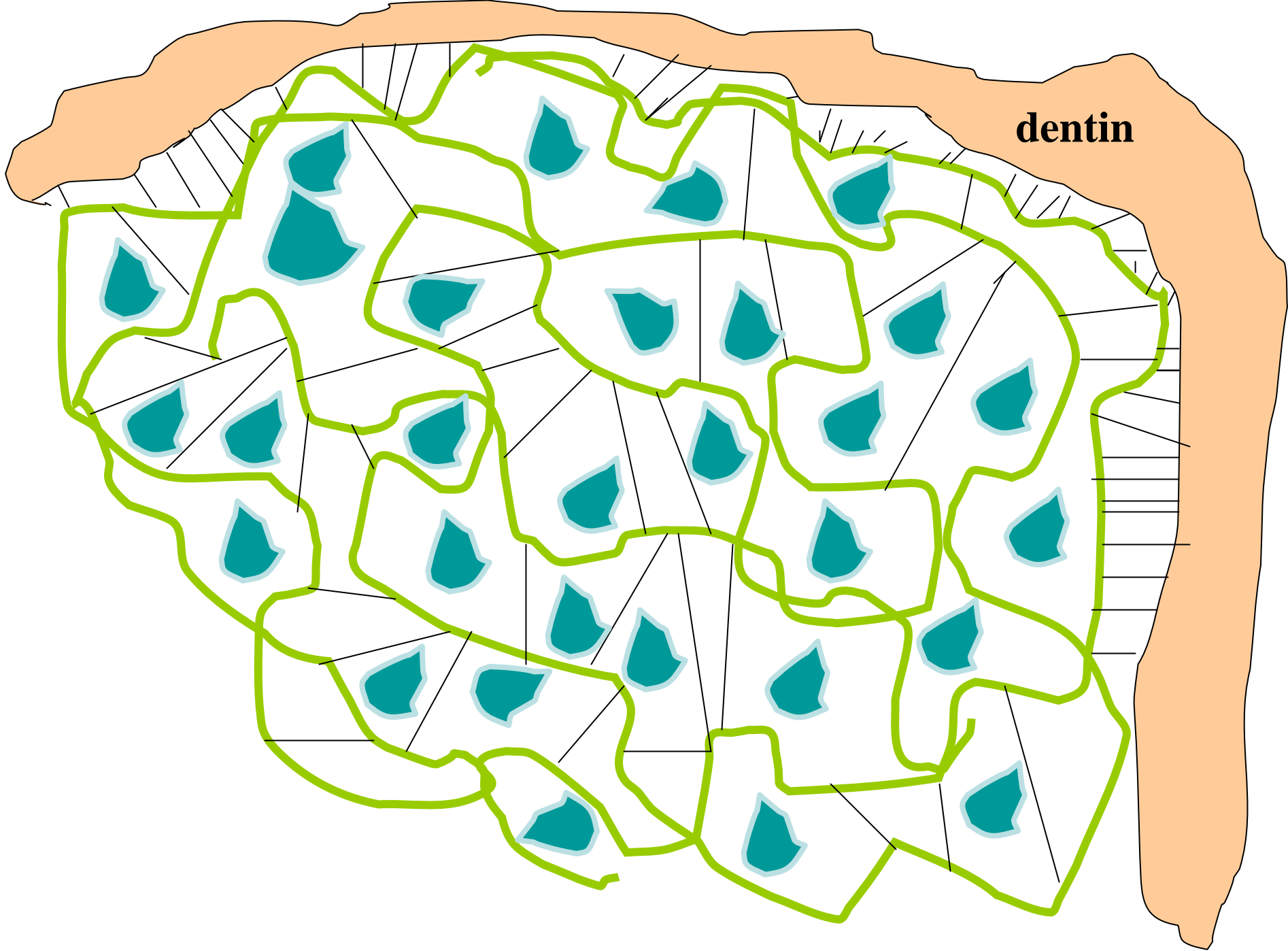


Properties

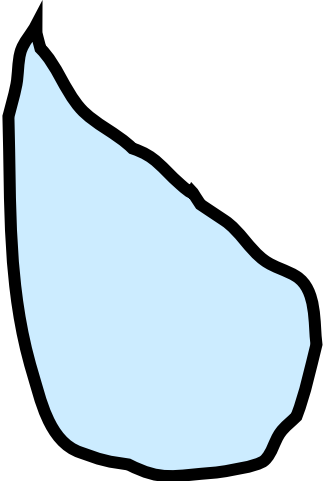
- Chemical fixation to tooth structure
- Fluoride release
- Favorable thermal expansion
- Acceptable aesthetics

GIC according to mode of curing

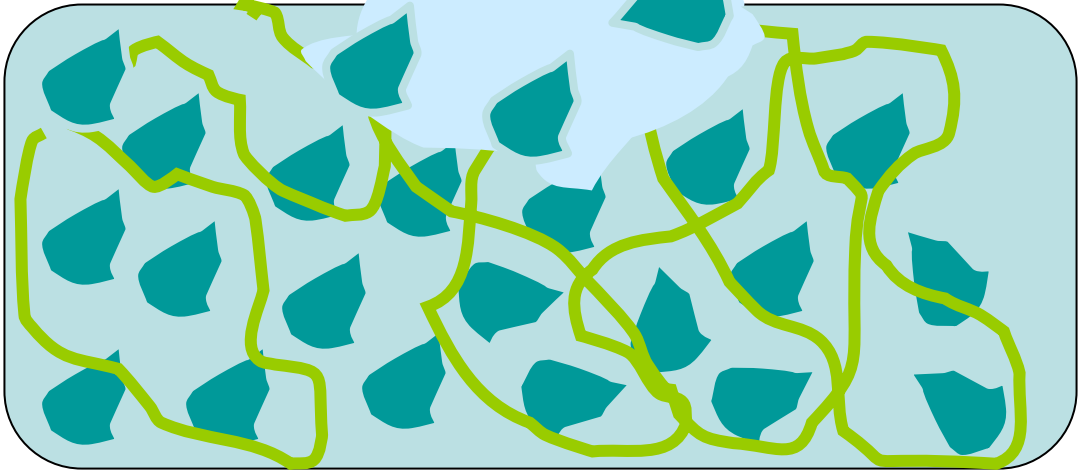
- Chemically curing (acid - base reaction)
 - - conventional
 - - high strength
- Light curing (acid -base reaction + polymerization of the resin)

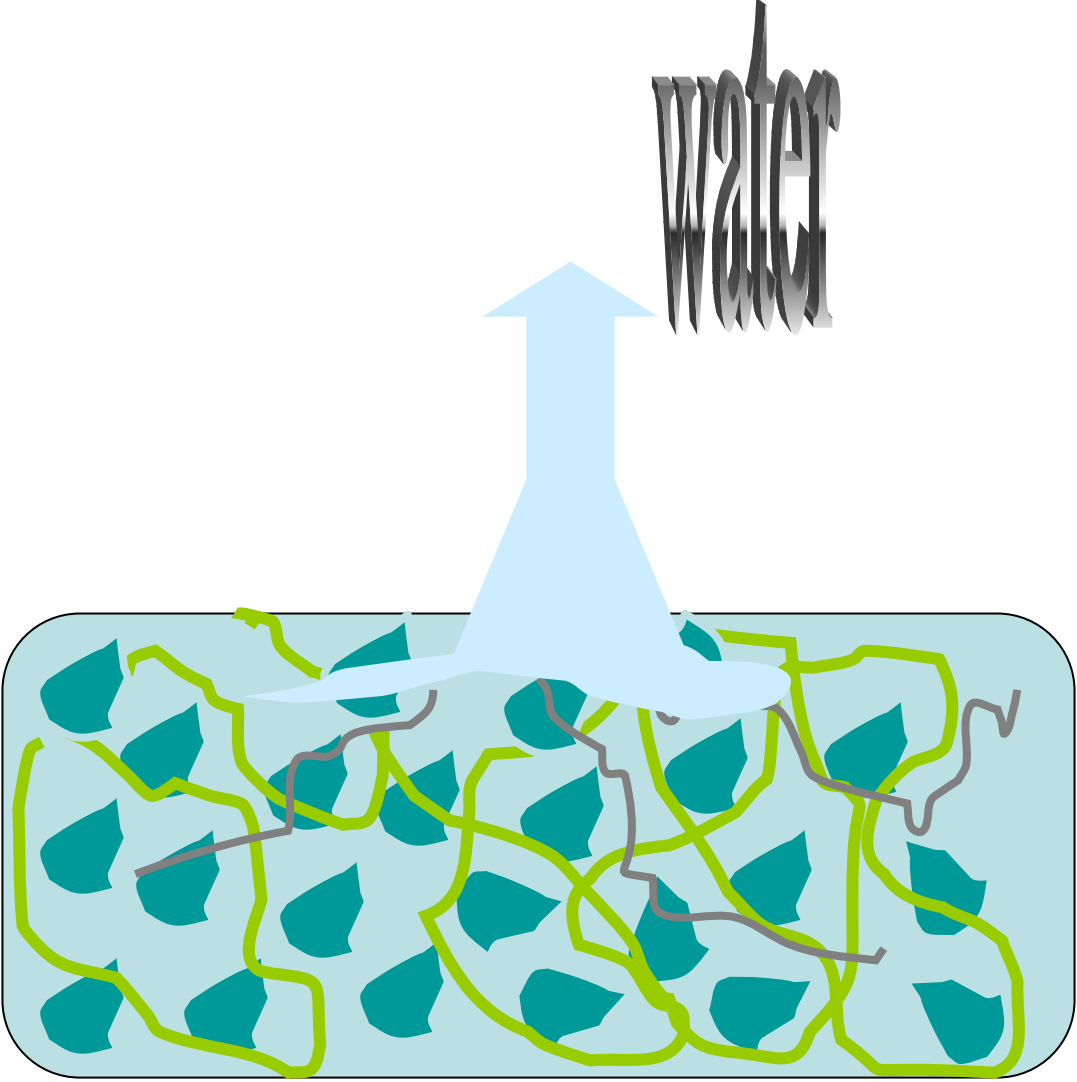


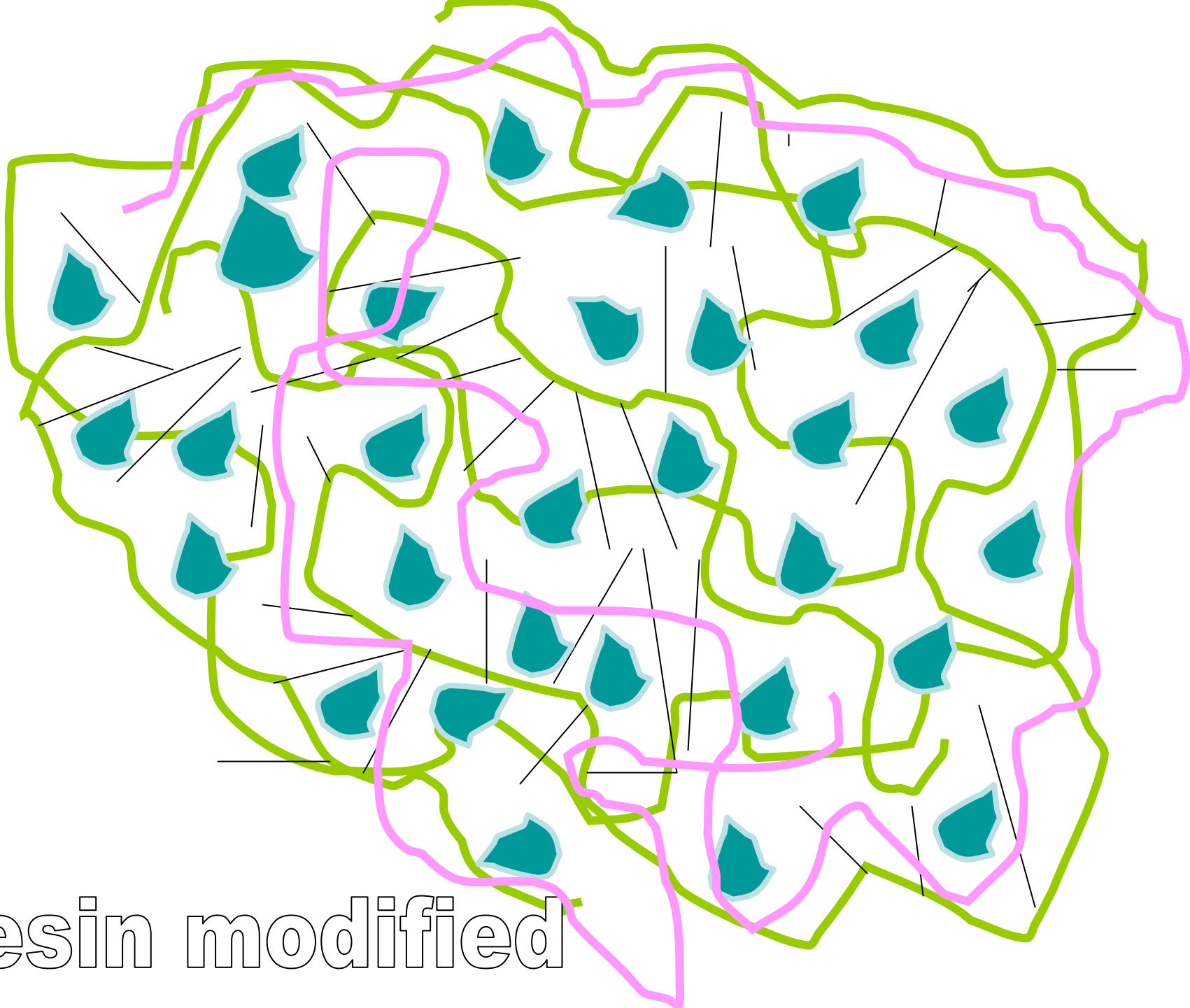
dentin



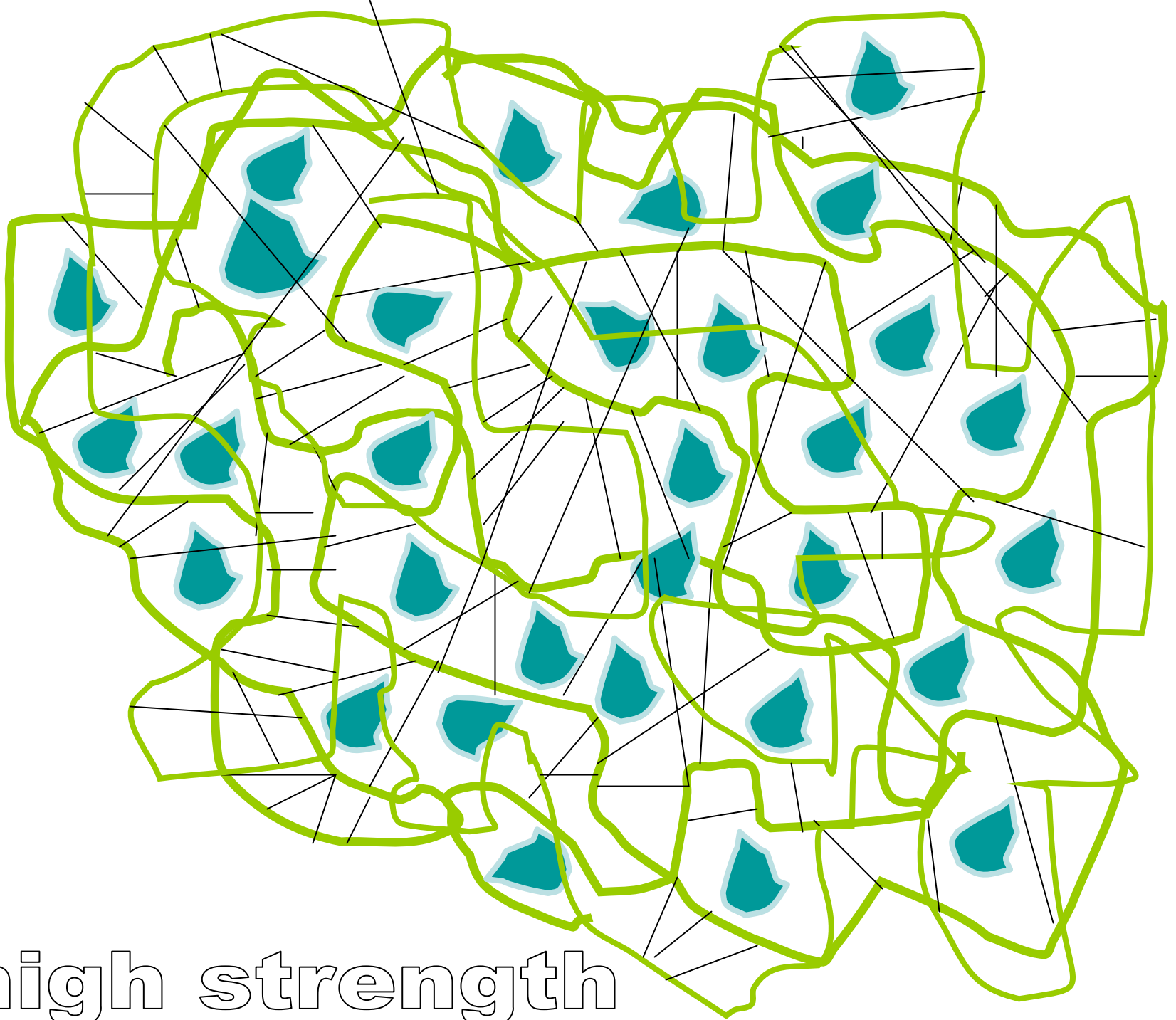
water







resin modified



high strength

GIC – indication

- Class V, small class I., class III.
- Base – sandwich fillings
- Luting cements
- Root canal filling

Glasionomers

- Hand mixed

Check the mixing ratio – the drop without any bubbles

- Power mixed - capsulated– aktiovation of a capsula

Forceps fo activation, forceps for application