

الأكثر استخدام.

Film coating

- Film coating is the most modern and generally used method nowadays.
- Nearly all newly launched coated products are film coated rather than sugar coated.
← حكيما هاي طريقة تقايرية
- Depending on the materials used in coating it is either for:
 - 1 – immediate release (non-functional coating) or
 - 2 – modified (delayed or extended) release (functional coating).

Film coating

Advantages of film coating

- 1) Reduction in coating time.
- 2) Usually single stage
- 3) Small increase in tablet weight
- 4) No significant increase in disintegration time (*immediate release.*)
- 5) Less chipping and cracking

سای الیقه ← مقارنه با ← لکان ←
Sugar coating.

Film coating

Coating suspension formulation :

- ① • Polymer (Film former) ^{good} (many of monomers connected together).
- ② • Plasticizer → polymer بفيقها على ال
flexibility عشان أزيد ال
of it. ↓ } ال ال strength عشان
Flexible بحتاجها تكون } صيغته يستخرجها أعلى
عشان فايصير لها } coating.
- ③ • Color
- ④ • Solvent
* لا يبي بطبق ال
لي liquid بعدين
form
بستنا ه حتمه لينشف حتمه
coating (زي قبدأ الدهان)

* قش آي polymer
تقدر استخرد معا بال
Coating في عندي
شروط صينه.

Film coating polymers

Ideal characteristics of a film forming polymer

① Solubility

• Polymer solubility is important for two reasons:

- 1- It determines the behavior of coated product in the GIT. ← عندي مثلا ان
- 2- It determines the solubility of the coating in a chosen solvent system ← وتحدد نوع ال solvent بال بتسخره خلال عملية ال coating.

- immediate release
لازم ان

Coating polymer
تكون

highly soluble
in the stomach
على عكس ال

- extended release
not soluble
بس بتسرع بمرور
water ال
لدا في الحية

• Film coatings that are used in immediate release products have usually good solubility in aqueous fluids, while those used form modified release have limited or no solubility in aqueous media.

- delay release ↴
soluble in media
with high pH.

Film coating polymers

Ideal characteristics of a film forming polymer

Viscosity depending on:

- ① level of interaction of polymer with solvent.
- ② number of monomer in polymer.

② Viscosity

- Polymers applied as solutions in a selected solvent should have relatively low viscosity.

لأنه بعد coating عن طريق ال spraying ← لصعك الاستيعاب
low viscosity. and atomization

- High viscosity complicates the product transfer of the coating liquid from the storage vessel to the spray guns, and subsequent atomization.

① صعوبة على النقل

Film coating polymers

Ideal characteristics of a film forming polymer

- ③ Permeability → 1. permeability of gases. → coating stability
- Film coating can be used to optimize the shelf-life of a tablet preparation, as some polymers are efficient barriers against the permeability of water vapour or other atmospheric gases.
رجتا چه نیون impermeable to the gases, water vapor.
 - These properties vary widely between the individual polymers.
 - Polymers for extended release coating should be permeable to water (and drug in conventional systems)
+ polymer not soluble in stomach.

Film coating polymers

Ideal characteristics of a film forming polymer

④ Mechanical strength

Film-coating polymers should possess suitable characteristics with respect to:

• Film strength, which greatly affects the ability of the coating to resist the mechanical stresses to which it will be exposed during the coating process and during subsequent handling of the coated product.

• Film flexibility, which imparts similar benefits to film strength and minimizes film cracking during handling or subsequent storage.

• Film adhesion, which is necessary to ensure that the coating remains adherent to the surface of the dosage form right up to the point of being taken by the patient.

مس
فانكون كس
عاليه جيت
فانقار
الحيه بالمده
مياثر على ار
release of
Drug.
عده
عنان
مالس
تسققار

→ bonding force between two different molecules.

Film coating polymers

Ideal characteristics of a film forming polymer

The film forming material (polymer) should also have the following characteristics:

- ① • It should be capable of producing a continuous elegant and smooth film.
- ② • It should be essentially with no color, taste or odor.
- ② • It should be compatible with common coating additives *chemically.* *توافق كيميائي بين التفاعل*
- ④ • It should be nontoxic and pharmacologically inert. *غير سامة*
- ⑤ • It should be stable in the presence of heat, light, moisture, air, and the substrate being coated (no change with aging). *pharmacological effect*

لأنه يمكن تكون سبب استخدام ال coating انه احافق على ال moisture. or light من ال active ingredient

Film coating

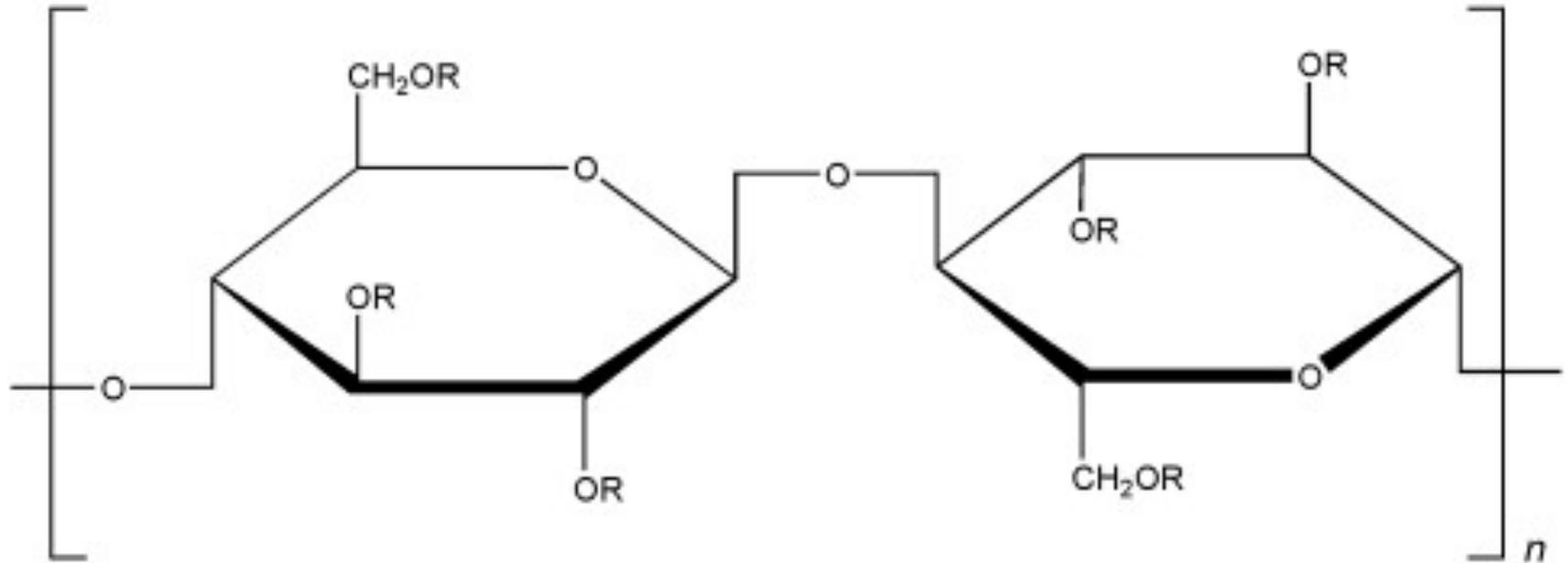
- Combination of polymers may be used to modify the film properties.
- Many water insoluble polymers are available as aqueous dispersions.
- Some polymers are efficient barriers against the permeability of water vapor and atmospheric gases, therefore they can be used to increase the shelf-life of tablets.

Types of film forming polymers

① Polymers for immediate release

- Cellulose derivatives → (موجود في خشب
الاشجار) أكثر polymer فتش
في الفصيلة
 - ↳ Hydroxypropyl methylcellulose (HPMC) → أكثر استعمالاً
• Soluble in aqueous media and organic solvents
• Form good films
cellulose with chemical modification
 - ↳ Methylcellulose
– Hydroxypropylcellulose (HPC)
– Hydroxyethylcellulose (HEC)
– Methylhydroxyethylcellulose
↳ semisynthetic polymers.
- Vinyl derivatives → completely synthetic
 - Povidone (polyvinyl pyrrolidone, PVP) → polymer with many type of monomers
 - Copovidone (A copolymer of vinyl pyrrolidone and vinylacetate)
 - Polyvinyl alcohol (PVA): exhibits good barrier properties to environmental gases and water vapor
↳ two types of monomers.
- Polyethylene glycols → used as binder in tablets, in suppositories
- Aminoalkyl methacrylate copolymers (Eudragit E®)
↳ taste masking. ← بالعادة يستعمل في soluble in water only at low pH.

Structure
 ال
 من سلف



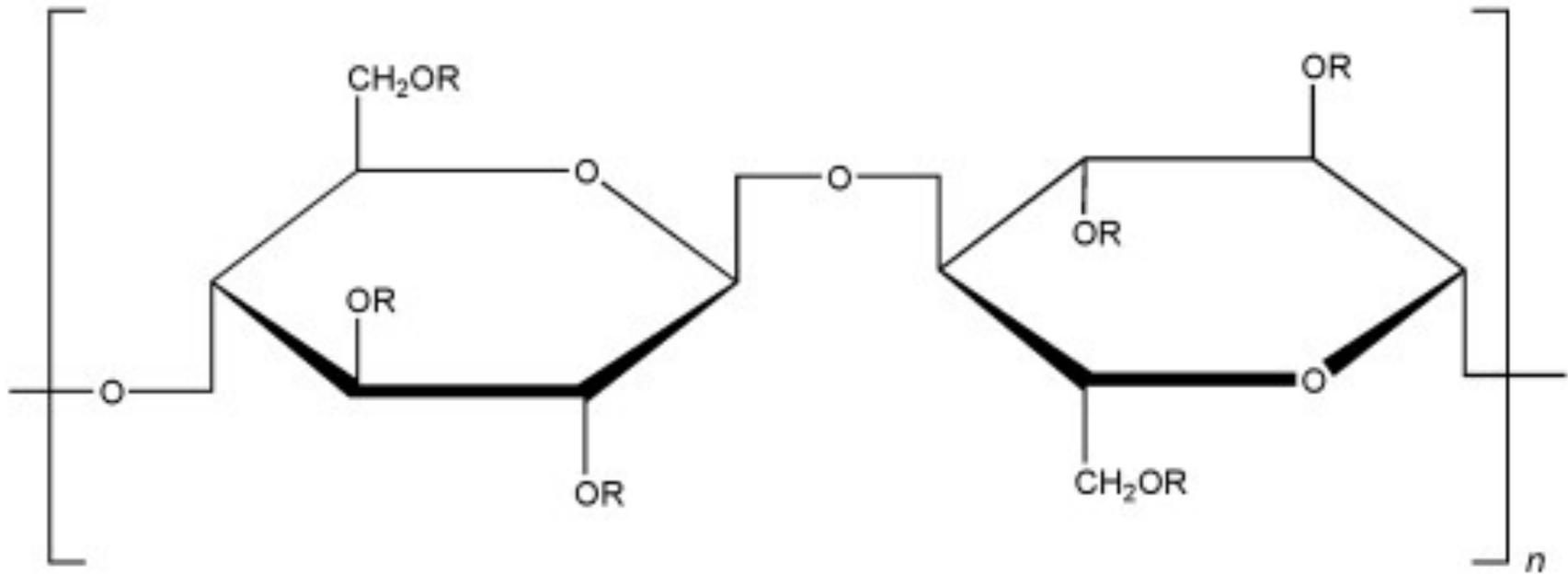
where R is $\underline{\text{H}}$, $\underline{\text{CH}_3}$, or $\underline{\text{CH}_3\text{CH}(\text{OH})\text{CH}_2}$

water ← cellulose فانجود باء

Hydroxypropyl methylcellulose (Hypromellose, HPMC)

تبنزير ذائبيۃ ال

water ← cellulose



R is H or $[\text{CH}_2\text{CH}(\text{CH}_3)\text{O}]_m\text{H}$

Hydroxypropylcellulose

metnyl
grub.
له حاني

Types of film forming polymers

② Sustained release polymers

① Cellulose derivatives

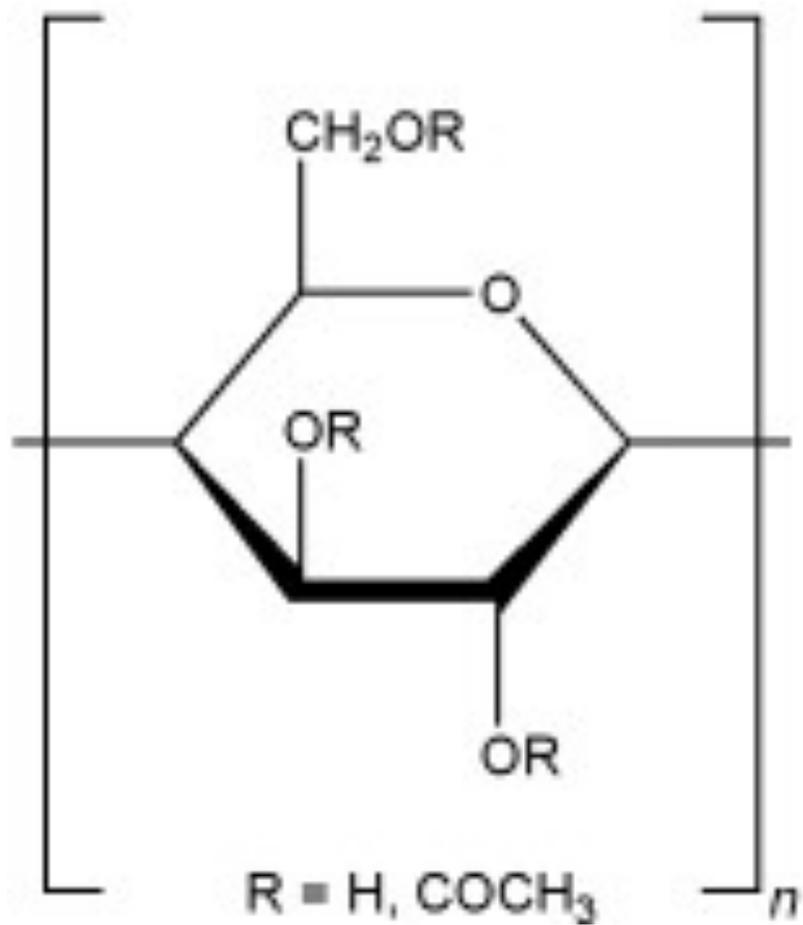
- more hydrophobic and less soluble in water. ^{انسایی ←} – Ethylcellulose
- Cellulose esters (cellulose ^①acetate, cellulose acetate butyrate) ②

② Methylmethacrylate copolymers (Eudragit RS[®], Eudragit RL[®])

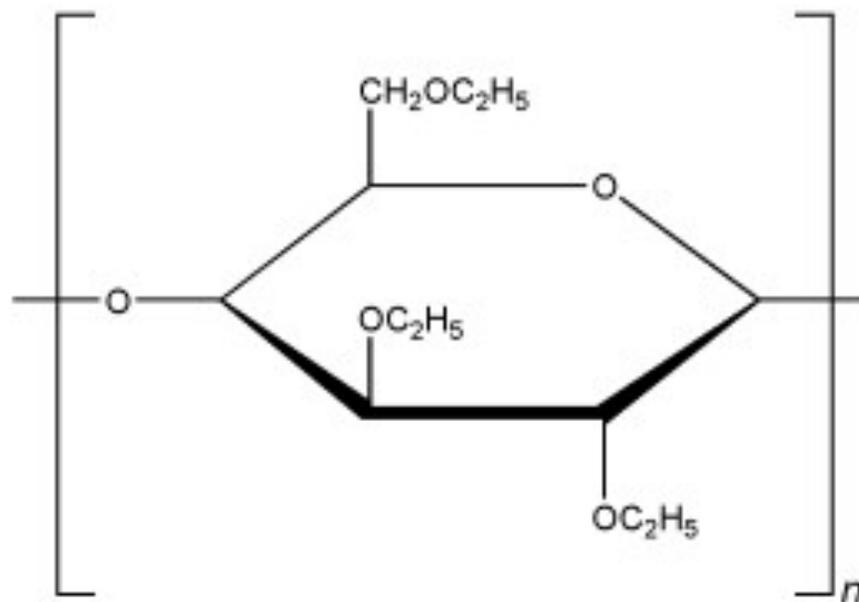
↓
Eudragit E
↓
immediate release

③ Silicon elastomers

④ Polyvinyl acetate



Cellulose acetate



Ethylcellulose