

Polymer profiles: an overview



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4. 4. POLYMER PROFILES:

Hydroxy Propyl Methyl Cellulose (HPMC)

Synonyms: Cellulose Hydroxypropyl methyl ether

Functional Category:

Release retardant, Coating purpose it used, film-former, suspending agent, stabilizing agent, tablet binder and viscosity increasing agent.

Pharmaceutical application:

Hydroxypropylmethylcellulose is widely used in oral formulations. It is used in contain solution of 2-20 % w/w in tablet coating of tablets. In aqueous coating low viscosity grades of Hydroxypropylmethylcellulose in aqueous coating solution used while higher viscosity grades are used with organic solvents. It is also used as a suspending and thickening agent in topical formulations.

CARBOPOL

Synonyms: Acritamer; acrylic acid polymer; Carbopol; carboxy polymethylene, polyacrylic acid; carboxyvinyl polymer; Pemulen; Ultrez

Solubility: Carbopol is soluble in water, alcohol and glycerin.

Functional Category: Bio adhesive, emulsifying agent, release- modifying agent, Suspending agent, tablet binder, viscosity-increasing agent.

Pharmaceutical Applications: In tablet formulations, Carbomer are used as dry or wet binders and as a rate controlling Excipient. In wet granulation processes, water or an alcohol–water blend is used as the granulating fluid. Anhydrous organic solvents have also been used, with the inclusion of a polymeric binder. The tackiness of the wet mass can be reduced with the addition of certain cationic species to the granulating fluid.

POLYMETHACRYLATES

Description: Polymethacrylates are synthetic cationic and anionic polymers of dimethylaminoethyl methacrylates, methacrylic acid, and methacrylic acid esters in varying ratios. Several different types are commercially available and may be obtained as the dry powder, as an aqueous dispersion, or as an organic solution.

Functional Category: Film former, tablet binder, enteric coating polymer

Table 1. 8. Solubility and Applications in Pharmaceutical Formulation or Technology:

Type	Supply form	Recommended solvents	Solubility/permeability	Applications
Eudragit RL100	Granules	Acetone, Alcohols	High permeability	Sustained release
Eudragit Granules	Granules	Acetone,	Low	Sustained

it RS	es	Alcohols	permeabil	release
100			ity	
Eudrag			Low	Sustained
it RS	Powder	Acetone, Alcohols	permeabil	release
PO			ity	

GLYCERYLBEHENATE

Synonyms: Compritol 888 ATO; 2, 3-dihydroxypropyldocosanoate; docosanoic acid, 2, 3-dihydroxypropyl ester; glycerol behenate; glyceryl monobehenate; tribehenin.

Functional Category: Coating agent; tablet binder; tablet and capsule lubricant.

Pharmaceutical Applications: In pharmaceutical formulations, glyceryl behenate is mainly used as a tablet and capsule lubricant and as a lipidic coating Excipient. It has been investigated for use in the preparation of sustained release tablets, and as a matrix- forming agent for the controlled release of water-soluble drugs.

SODIUMALGINATE

Synonyms: Algin; alginic acid, sodium salt; Kelcosol; Keltone; Protanal; sodium polymannuronate.

Functional Category: Stabilizing agent; Suspending agent; tablet and capsule Disintegrant; tablet binder; viscosity-increasing agent.

Pharmaceutical Applications: In tablet formulations, sodium alginate may be used as both a binder and Disintegrant; It has been used as a diluent in capsule formulations. Sodium alginate has also been used in the preparation of sustained-release oral formulations since it can delay the dissolution of a drug from tablets, capsules, and aqueous suspensions.

CHITOSAN

Synonyms: 2-Amino-2-deoxy-(1, 4)- β -D-glucopyranan, deacetylated chitin,

Chemical Name: Poly- β -(1, 4)-2-Amino-2-deoxy-D-glucose.

Functional Category: Coating agent, film-forming agent, Mucoadhesive tablet binder and viscosity-increasing agent.

Applications: It is used as a component of sustained release dosage form & mucoadhesive dosage forms.

XANTHAN GUM

Synonyms: Corn sugar gum, Keltrol, Rhodigel, Vanzan NF, Xantural.

Functional Category: Stabilizing agent; suspending agent; viscosity-increasing agent.

Pharmaceutical Applications: Used in cosmetic and foods as a suspending and stabilizing agent. Although primarily used as a suspending agent, Xanthan gum has also been used to prepare sustained-release matrix tablets.

GUAR GUM

Synonyms: Galactosol; gaurflour; jaguar gum; meproгат; meyprodor.

Chemical name: Galactomannan polysaccharide.

Functional Category: Suspending agent, Tablet binder, Tablet disintegrant,

Viscosity increasing agent.

Applications in Pharmaceutical Technology: Used in solid dosage forms as a binder (up to 10%) and disintegrant. Used in oral and topical products as a suspending, thickening (up to 2.5%) and stabilizing agent (1%). Used in colon targeted drug delivery systems. Also, used in cosmetic and food products. POLY VINYLPIRROLIDINE (PVP)

Synonyms: Kollidon; Plasdone; poly[1-(2-oxo-1-pyrrolidiny)ethylene]; polyvidone;

polyvinylpyrrolidone; PVP; 1-vinyl-2-pyrrolidine polymer.

Functional Category: Disintegrant; dissolution aid; suspending agent; tablet binder.

Pharmaceutical Applications: Primarily used in solid-dosage form. In tableting, Povidone solutions are used as binders in wet-granulation processes. Povidone is also added to powder blends in the dry form and granulated in situ by the addition of water, alcohol, or hydro alcoholic solutions. Carrier for drugs 10-25% of solution is used and in case of tablet binder, coating agent it is used in 0.5-5%.

TALC

Synonyms: Altalc; hydrous magnesium calcium silicate; hydrous magnesium silicate; Luzenac; Luzenac Pharma; magnesium hydrogen metasilicate; Magsil Osmanthus; Magsil Star; powdered talc; purified French chalk; Purltal; soapstone; steatite; Superiore.

FunctionalCategory: Anticaking agent; Glidant; tablet and capsule diluent; tablet and capsule lubricant.

PharmaceuticalApplications: Talc was once widely used in oral solid dosage formulations as a lubricant and diluent, although today it is less commonly used. However, it is widely used as a dissolution retardant in the development of controlled- release product.

AEROSIL(COLLOIDALSILICON DIOXIDE)

Synonyms: Colloidal silica; fumed silica; light anhydrous silicic acid; silicic anhydride; silicon dioxide fumed.

FunctionalCategory: Adsorbent; Anticaking agent; emulsion stabilizer; Glidant; suspending agent; tablet Disintegrant; thermal stabilizer; viscosity-increasing agent.

PharmaceuticalApplications: Its small particle size and large specific surface area give it desirable flow characteristics that are exploited to improve the flow properties of dry powders in a number of processes such as tableting. Colloidal silicon dioxide is also used as a tablet Disintegrant and as an adsorbent dispersing agent for liquids in powders. used to stabilize emulsions and as a thixotropic thickening and suspending agent in gels and semisolid preparations

MAGNESIUM STEARATE

Synonyms: Metallic stearate, Magnesium salt.

Functional Category: Tablet and capsule lubricant, Glidant, Anti-Adherent.

Pharmaceutical Applications: Tablet and capsule lubricant, Glidant, Anti-Adherent.

MICROCRYSTALLINE CELLULOSE (MCC)

Synonyms: Avicel PH; Celex; cellulose gel; Celphere; Ceolus KG; crystalline cellulose; E460; Emcocel; Ethispheres; Fibrocel; Pharmacel; Tabulose; Vivapur.

Functional Category: Adsorbent; suspending agent; tablet and capsule diluent; tablet disintegrant.

Applications in Pharmaceutical Formulation or Technology:

Microcrystalline cellulose is widely used in pharmaceuticals, primarily as a binder/diluent in oral tablet and capsule formulations where it is used in both wet-granulation and direct compression processes. In addition to its use as a binder/diluent, microcrystalline cellulose also has some lubricant and disintegrant properties that make it useful in tableting.