

Protective Pill Coatings

The protective coatings placed around pills are almost as important in the treatment of illnesses as the chemicals included in the pills. Pill coatings fulfill a variety of purposes, depending on the type of medication they are encasing. In some circumstances, the coating is used to extend the useful life of the drug by protecting it from exposure to temperature, moisture or light. The coating also keeps pills from being cracked or broken during handling. Some protective coatings mask the taste of the chemicals, making the pill easier to swallow. In other cases, the coating acts as a protective barrier, keeping the pills from being



dissolved by highly-acidic stomach conditions or extremely-basic small intestine conditions so they dissolve in other target locations, where they are more effective. Stomach absorption must be prevented in cases in which the medication is a stomach irritant. Other situations require that the drug be dissolved in the stomach, so the covering is formulated to dissolve quickly.

Pill coatings are used for more practical purposes as well. Some coatings can be printed on by special printers, aiding in the labeling process. When pills are labeled by indentations, the coating must be thin enough to form to the shape of the pill and not mar the labeling. Thinner, less bulky coatings are preferred as they are helpful in decreasing the cost of packaging and shipping. Pills' coatings must be non-sticky to prevent them from sticking together during shipment and storage. Incorporating colors and patterns into the surface coatings is useful for marketing efforts. Engineers are involved in developing and testing chemicals for coatings as well as designing the manufacturing systems required to mass produce uniformly-coated pills.

Historically, sugar coating was the most popular pill coating. Due to the numerous drawbacks of sugar coating, modern coatings often have a polymer and polysaccharide base and include additives such as pigments and plasticizers. Incidentally, one coating that is used for candies as well as medications is confectioner's glaze or pharmaceutical glaze, which is used as an enteric coating in the pharmaceutical world and as a glossy finish and protective coating on both candy and medications. The primary ingredient in this coating is "shellac," an excretion from laccifer lacca or kerria lacca, a bug of the lac family. This excretion is harvested from trees and processed and refined. Another natural coating used on both candies and pills is carnauba wax, a product derived from the leaves of the carnauba palm.

Sources for images to show students:

See a photograph of shellac excretions at the Spectroscopy NOW website:

www.spectroscopynow.com/ftp_images/2Lac2.jpg

See a photograph of unprocessed shellac at the Lexportex (India) Pvt. Ltd. website:

www.indianshellac.com/pics/pic2.jpg

See a photograph of a supercell tablet coater at the GEA Process Engineering Inc. website:

http://www.niroinc.com/images/pharma_systems/supercell_tablet_coater.jpg