POLYMER MATRICES FOR CONTROLLED RELEASE DRUGS

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Some kinds of polymeric matrices have been studied to compose different kinds of drug delivery systems as transdermic patch for hormone reposition. The utilization of transdermic patch therapy presents some advantages in relation to conventional one as the release in a constant level of drug could avoid collateral effects caused by the presence of peaks of the drug concentration in the blood. The adhesive power in relation to the amount of hypoalergenic acrylic adhesives applied were studied and compared with commercially transdermic patch for hormone reposition therapy. The in vitro biocompatibility study was performed with selected adhesive film by cytotoxicity assay. Based on the results we are continuing the study with hypoallergenic acrylic emulsion, water based which showed no toxic effect and adequate adhesive power to compose transdermic patch drug delivery system. In the other hand silicone, an important polymeric biomaterial used mostly as breast prostheses, showed good properties to be used, as matrix for drug delivery system but requires further investigation due to the presence of olygomers and catalysis residues after chemical reticulation. This group proposed to study the use of a catalysis-free system as a way of crosslinking. Two medical-grades olygomers of silicone were evaluated. The sterilization and crosslinking was performed by ionizing radiation and physical-chemical properties as well as biocompatibility were assessed. Gel fraction and swelling assays were performed utilizing analytical grade toluene. Both grades of medical-grade silicone achieved high gel content determined by gel fraction measurement. The cytotoxicity assay, also confirmed no toxicity property of the material. Based on these results, in order to obtain better properties of silicone to compose drug delivery system, further experiments are presently under way in our laboratory to study the incorporation and in vitro release kinetic of active compounds. (Biolab Sanus Farmacêutica Ltda, RHAE, Dow Corning, Instituto Adolfo Lutz)

SYNTHETIC GRANITE DEVELOPMENTS

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In an attempt to use an inexpensive and highly renewable source of raw-material, natural fibers were added to solid surface formulations. At first, bamboo and sugarcane fibers were previously treated with lime and water-washed; afterwards, clean fibers were oven dried at approximately 70°C, for a five-hour period. At a 3% level, fibers were added to a polymeric mass containing around 90% of polyester ortophtalic and 10% of mineral fillers, in a reactor maintained at room temperature. “Cake” resulting was poured in rectangular molds, of approximately 1 m^2. After curing for 1 hour, plaques obtained were ready to use. Both fibers showed a good processing, but bamboo fibers presented a better performance. Synthetic Granite Laboratory, in CQMA, was completely equipped with these plaques; benches installed last October 2003 were completely successful in terms of resistance to chemical and physical agents until now. Polymers based on acrylic and methacrylic esters are widely used in synthetic stones, surface coatings and adhesives formulation due to their good characteristics of film forming, mechanical properties, optical clarity and overall stability. Composition products of polymer formulations (FIG.1) were studied by thermogravimetry / gas chromatography separation and mass spectrometry (TGA-GC/MS). The system couples thermal analysis with gas chromatography separation and mass spectrometry identification methods. This system provides the analysis of thermal decomposition products of polymer formulations and identification of evolved gases from TGA by means of GC/MS. By results obtained it was possible to know samples behavior when submitted to heating as well to identify formulations components, according to particular retention times for each one of them. Combining thermogravimetric analysis (TGA) and mass spectrometry provides a powerful analytical tool for studying polymer degradation. Thermal decomposition of volatile products from acrylic, PET and polyester resins was successfully evaluated by combining experimental techniques, TGA-GC/MS. Collected results showed that termogravimetry connected to GCMS can be a reliable technique in order to predict or control the composition of polymeric formulations via products identification.

FIGURE 1 - Synthetic Granite.