Cosmetic and pharmaceutical qualifications of Egyptian bentonite and its suitability as drug carrier for Praziquantel drug.

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Abstract:

The aim of this paper is to characterize and evaluate newly discovered bentonite deposits in Egypt for pharmaceutical and cosmetic applications as well as its suitability as carrier for Praziquantel drug. The study was performed for the raw bentonite sample, purified bentonite sample and alkali activated purified bentonite sample. The raw bentonite sample composed mainly of montmorillonite contaminated by little amounts of quartz and calcite, while the purified sample composed of montmorillonite without detected mineral impurities and matches the mineralogical properties of Wyoming bentonite as an international standard. Geochemically, the studied raw and purified samples appear to high purity with a chemical composition close to those of Wyoming bentonite and match the pharmacopeia specifications. The chemical properties in addition to the textural properties of the surface area, porosity, particle size distribution qualify the bentonite products to use as a function in powder, emulsion and creams. Investigation of pharmacopeia properties of pH, sedimentation volume and swelling capacity revealed the suitability of the raw and purified samples for pharmaceutical and cosmetic applications. Moreover, the microbiological tests indicated that the samples free from harmful microbial pathogens. At the optimum conditions of time (240 min), bentonite dose (250 mg) and reaction temperature (60 °C), the obtained encapsulation percentages of Praziquantel drug are 62%, 78.4% and 93.2% for raw bentonite, purified and alkali activated bentonite, respectively. The releasing percentage of the drug using an intestinal buffer at pH 7.4 is more efficient and the maximum obtained values were obtained after 420 min. The obtained releasing values are 71%, 79.2% and 87.4% for raw bentonite, purified bentonite and alkali

Keywords:

Bentonite; Quseir area; Medical; Drug delivery; Praziquantel

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