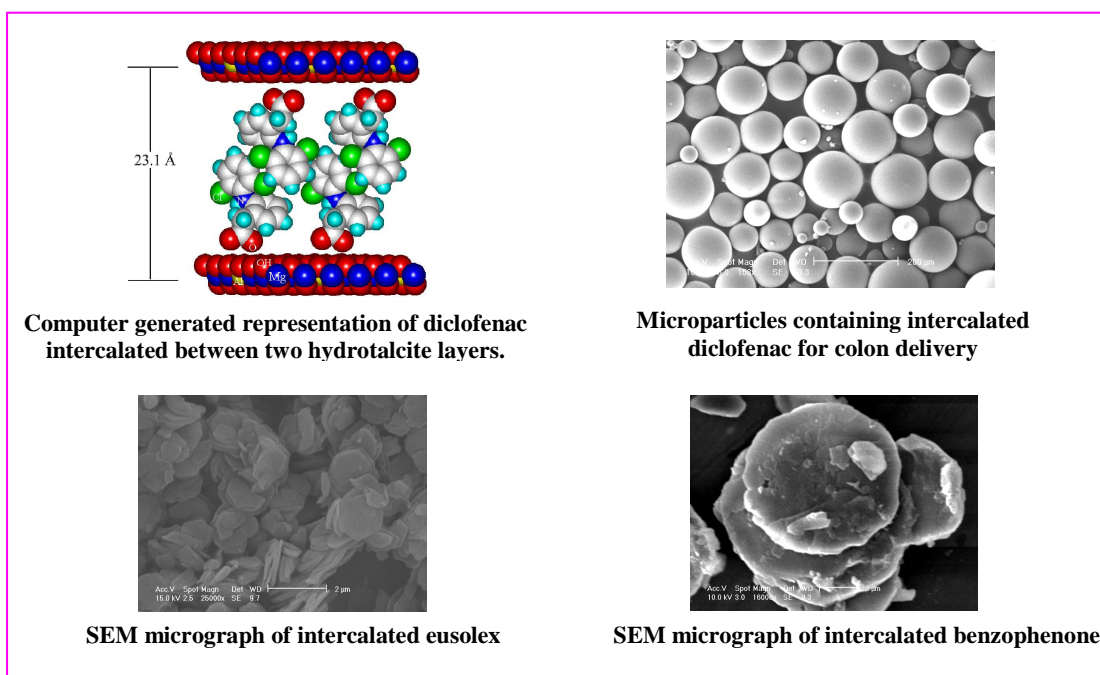


Use of synthetic hydrotalcites to deliver molecules with biological activity

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This research deals with the use of synthetic hydrotalcites, which are inorganic anionic layered solids, in order to introduce molecules with biological activity (drugs, cosmetics and sunscreens) into these matrices and to modify their delivery. These hydrotalcites (host) are able to intercalate anions (guest) between the layers (nanospaces) and then to release them as a consequence of a deintercalation process; moreover they can increase the guest stability and their protection range (in the case of sunscreen).



1. Description of the product

Synthetic hydrotalcites are inorganic anionic layered solids constituted by positive layers, whose positive charge is balanced by anions that lays into interlayer gallery and are exchangeable. The interlayer region is a micro vessel able to store, protect and release the biologically active molecules. The control of their release is possible by deintercalation process. The project involves, initially, the intercalation of not steroidal anti-inflammatories, cosmetic and nutraceutical ingredients into the hydrotalcites. Successively the intercalation product can be used for the realization of proper formulations (topical, oral) or systems, as microparticles for the colon release, mucoadhesive tablets for oral cavity, multi-phase tablets for an oral administration etc. In the case of solar cosmetics (sunscreens) it is possible to prepare effective and safe solar cosmetic products suitable to improve sunscreen photostability and to avoid its direct contact with skin.

2. Innovative aspect of the product

The use of these matrices is innovative and gives advantages because:

- preparation is rather simple and cheap
- matrices are extremely versatile, are able to modify the release, are directly compressible; some of them have antacid action and improve stability of intercalated molecules. The use of hydrotalcites in “solar” formulations is a new protection model and offers many advantages such as sunscreen stabilization, increase of absorption of ultraviolet lights (UV-A and UV-B), absence of a close contact between skin and filter with the consequent elimination of allergy problems, revaluation of old molecules, not expensive, currently not used.

3. Main advantages of the offer

Thank to the use of these matrices it is possible to realize formulation of not steroidal anti-inflammatory suitable for therapies of pathologies connected to colon and small intestine's inflammations, colon drug release, inflammation's therapy of oral cavity, oral multi-phase tablets' administration which consent a immediate and delayed release and, in the case of sunscreens, effective and safe UV protection. In the case of topical formulations, the hydrotalcite presence improves the rheological properties of products.

4. Technology key words

Inorganic matrices, intercalation, nanocomposite, formulations

5. Current Stage of Development

Development phase – laboratory tested

6. Intellectual Property Rights

The product of the research is not covered by patent

Technical and scientific publications

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