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Pre-formulation of solid preparations based on nano-montmorillonite

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Nanoclays are ubiquitous nanofiller and belong to a wider group of clay minerals. They are not new to humankind and ceramists have been using them in the development of clay products since prehistoric times. Even though the structure of nanoclays and their nature is being explored for decades and are being used since antiquity, their exact definition is an ongoing subject of debate. Clay minerals are hydrous silicates and may simply be described as fine-grained particles with sheet like structure stacked over one another. Owing to this geometry, they are commonly known as phyllosilicates, sheet-structured silicates. Nanoclays have found applications in many fields, including medicine, pharmacy, cosmetics, catalysis, food packaging and textile industry. In addition to these mentioned application, nanoclays are also helpful in environmental protection and remediation. Their potential as adsorbents for volatile organic compounds, and organic/inorganic contaminants in waste water is well documented. Montmorillonite (MMT) particles are naturally present with micrometer di-mension. On the other hand, micrometer scale clay shows decreased activity both in topics applications and in digestive tract since it has a lower absorption capability. No effort has been made for reducing the dimensions of the clay to nanoscale in manufacturing the exiting products. On the other hand, the viscosity-concentration ra-tio for liquid oral MMT formulations are not well established. In this study, we de-termined max. concentration of MMT in pure water as 10 % (W/V) and max uploading capacity of hydrophobic drugs as 25% (W/W) of total clay weight. These ratios are optimized ratios for drinkable oral suspensions of MMT.

Recent Publications:

1. Dong Y and Feng S S (2005) Poly d, l-lactide-co-glycolide)/montmorillonite nanoparticles for oral delivery of anticancer drugs. *Biomaterials*. 26(30):6068-76.
2. Cui F et al. (2006) Biodegradable nanoparticles loaded with insulin-phospholipid complex for oral delivery: preparation, in vitro characterization and in vivo evaluation. *J Control Release*. 114(2):242-50.
3. Carretero M I and Pozo M (2009) Clay and non-clay minerals in the pharmaceutical industry Part I. Excipients and medical applications. *Appl. Clay Sci*. 46(1):73-80.
4. Nazir M S et al. (2016) Characteristic properties of nanoclays and characterization of nanoparticulates and nanocomposites. 2016:35-55.
5. Senthil V et al. (2013) Development and challenges facing for insulin oral delivery. *International Journal of Pharmaceutical Science and Research*. 4(7): p. 2576.

Biography

Zeynep Küçük has completing her Bachelor's Degree at Bezmiâlem Vakıf University on Pharmacology. She has done several internships by now at different areas such as pharmacy, hospitals and manufacturing site that has pharmaceutical interests. Her research interest of includes nanotechnology and biotechnology.

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