

# STRUCTURAL PHYSICAL ANALYSIS OF THE PSEUDOTERNARY AND NANOESTRUTURED SYSTEM COMPOSED OF SOYBEAN PHOSPHTYLCOLINE AND HYDROGENATED CASTOR OIL

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**P**seudoternary and nanostructured systems are important resources to increase the solubility and transport lipophilic drugs, besides promoting controlled release of the drug, they can still increase their time permanence in the place of action. The work objective was to evaluate the physical structure of the pseudoternary and nanostructured system composed of soybean phosphatidylcholine and hydrogenated castor oil (tensoactive / cosurfactant, 50:50 ratio), capric triglyceride (oily phase) and acetate buffer pH 4.5 (aqueous phase) for intravaginal administration of drugs using polarized light microscopy (PLM), X-ray diffraction (XRD), small angle x-ray scattering (SAXS) and rheological behavior. PLM was made using polarized light microscope with magnification of 10 and 20 times. XRD and SAXS study evaluated the diffracted beams intensities in relation of the diffraction angles and the rheological behavior was evaluated by continuous and oscillatory tests using a plate/plate geometry (20 mm diameter) and rheometer at 30°C. The results of the PLM showed anisotropic structures that suggest crystals and "malt of crosses" showing a mixture of crystals and lamellar liquid-crystalline mesophase. Diffractograms presented fine and defined peaks, which also showed crystalline structures probably from system components. SAXS analysis presented the 1:2:3 ratio in the interplanar distances, which suggest lamellar mesophase. The results obtained with MLP, XRD and SAXS are complementary because the lamellar mesophase arrangements and the presence of many crystalline structures were observed in all techniques. Pseudoternary and nanostructured system presented non-Newtonian, anti-thixotropic and pseudoplastic rheological behavior. Oscillatory rheological analysis showed the predominance of the elastic behavior. These behaviors are advantageous for intravaginal administration because at the time application the system are fluid and after the tension applied, it was able to restructure itself by acquiring high viscosity again and promoting greater contact with the vaginal mucosa.

## Biography

Ligia de Souza Fernandes has completed her Master's degree from the Paulista State University "Julio de Mesquita Filho" (Faculty of Pharmaceutical Science) and currently is a Doctoral Student (PhD student) in the same university. Her advisor is Maria Virginia Scarpa and their research is based on the development of controlled release systems. She has published one article in an internationally renowned journal. During her Master's degree she has developed a partnership with the University of Porto (Portugal). She has worked in national and multinational pharmaceutical industry in R&D area and physical-chemical quality control. CAPES fund your research since master's degree.

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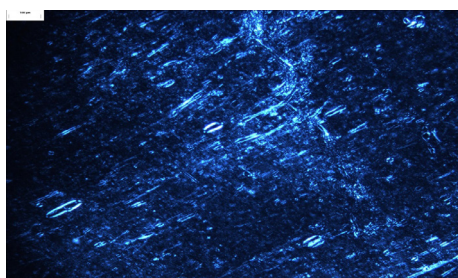
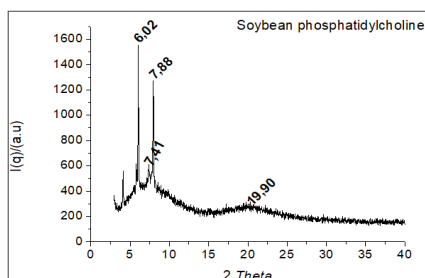
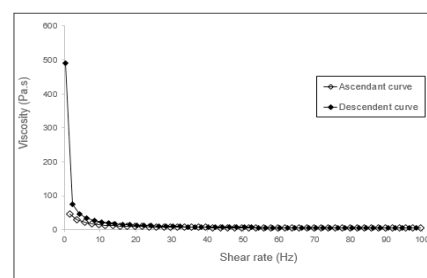


Figure 1: Photomicrograph of the pseudoternary and nanostructured system using 10x magnification (PLM)



Graph 2: Diffractogram of the soybean phosphatidylcholine



Graph 5: Flow curves of the pseudoternary and nanostructured system

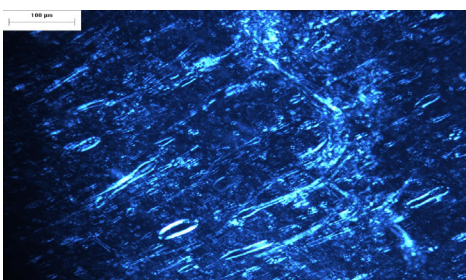
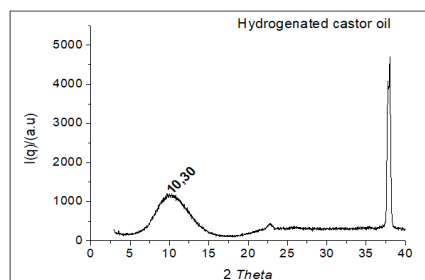
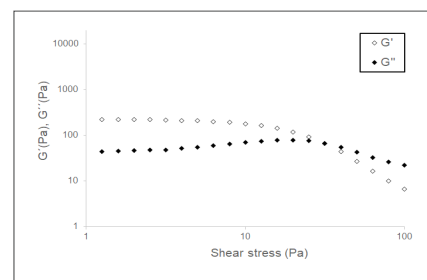


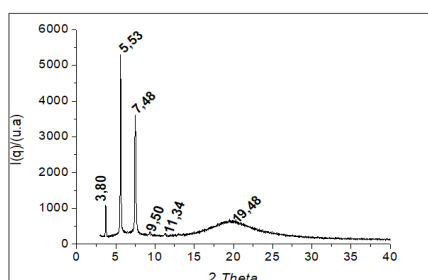
Figure 2: Photomicrograph of the pseudoternary and nanostructured system using 20x magnification (PLM)



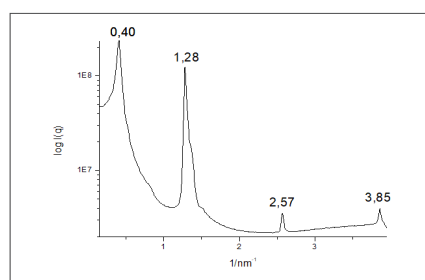
Graph 3: Diffractogram of the hydrogenated castor oil



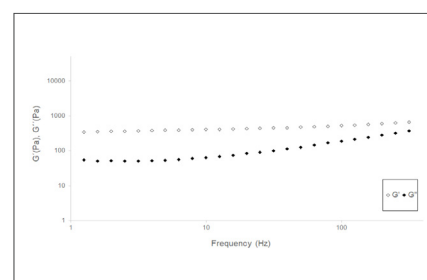
Graph 6 Stress sweep at 30°C ± 1



Graph 1: Diffractogram of the pseudoternary and nanostructured system



Graph 4: SAXS curve of the pseudoternary and nanostructured system and interplanar distances



Graph 7 Frequency sweep at 30°C ± 1