

## Natural rubber micro-device applied to fluid analysis: Thermal characterization of the polymeric support

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Natural rubber membranes were used for the preparation of micro-device called LAB-ON-A-SHIP, flexible and biocompatible, applied to fluid's research. The membranes are prepared by molding using a matrix built in the glass to support the latex extracted from *Hevea brasiliensis* tree. The thermal treatment were carried out by casting, annealing at 65°C during 10 hours.

The matrix for sensors was prepared in a size of 2.5 x 2.0 cm with optical window of 1 cm<sup>2</sup> and channels of 1 mm in diameter. Composites of natural rubber with antioxidants (Protetox-NS) and paraffinic oil were also prepared.

The purpose operating of the sensor determines that the fluids are injected into the channels generated in the polymeric matrix, by means of a peristaltic pump flow control, using catheters such as connectors. In the future, carbon fiber electrode with both immobilized enzyme and metal will be tested for the analysis of fluids into the optical window.

Actually, we evaluated the natural rubber matrix relative to the light transmission through the window by UV-Vis spectroscopy and both the thermal and structural properties by means of thermogravimetry (TG), differential scanning calorimetry (DSC) and FT-IR spectroscopy, based on the different compositions tested for the preparation of sensors looking for higher thermal stability and better degradative properties.

### Biography

F. C. Cabrera has completed his Ms. at the age of 23 years from UNESP University and actually he is in course of Ph.D in Materials Science and Technology. He has published 3 papers in reputed journals about SERS sensors analysis by Raman spectroscopy and biological membranes with nanostructures used to decrease *Leishmania brasiliensis* promastigotes culture in vitro. He spent 3 months in Canada last year researching on Windsor University under supervision of Professor Ricardo F. Aroca.

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