**Development of biothermosetting resins**

**HNT/polycaprolactone via thiol-ene radical photocrosslinking for anticorrosive applications: Preliminary study**

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**Abstract**

The overall objective of this work is the elaboration of polymer-clay thermoset bionanocomposites (HNT/PCL). The aim is to create a covalent bond between the two components by a thiol-ene radical photocrosslinking addition. The external surfaces of the halloysite clay were modified with a silylating agent, 3-(trimethoxysilyl)-1-propanethiol (TESP). On the other hand, functionalization of the chain ends of commercial diol-terminated PCL with acrylates (PCL-DA) was also successfully performed. Different bionanocomposites were developed by varying the percentage of clay filler. The modified HNT clay, PCL-DA as well as the obtained resins were analyzed by FTIR, 1H NMR and SEM spectroscopy. The morphological structures of the modified and unmodified HNT as well as the thermosetting bioresins were characterized by SEM, and the hydrophobic/hydrophilic surface properties were analyzed by contact angle measurement. Thermal properties of the nanocomposite films were performed by TGA and DSC, the results showed that the nanocomposites developed with 3% HNT showed a slight increase in thermal stability compared to PCL. Preliminary tests on PCL/HNTs 3% resin films as a protective coating against corrosion of an iron plate placed in acidic medium were carried out by following the appearance of the film as a function of time in comparison with an uncoated iron plate, and the first results obtained are promising and open investigation perspectives.



Miss Habiba ZIBOT is a PhD student at Cadi Ayyad University, she graduated with a master’s degree in R&D in Solid State Physics and Chemistry "Polymers and Environment" option. She is working on development of biothermosetting resins HNT/polycaprolactone via thiol-ene radical photopolymerization for anticorrosive applications.

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