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MORPHOLOGY, STRUCTURE AND COLOR PROPERTIES OF MIXES FILMS CONTAINING A DIACETYLENE AND A HEMICYANINE DERIVATIVE.

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Polydiacetylenes is family of great interest because of their colour transitions in response to other stimuli, including heat (thermochromism), changes in the chemical environment such as pH and bind to specific biomarkers (affinochromism and biochromism). The reversibility of this transition depends on the specific structure of the polydiacetylene and environmental stimulus. Overall, the observed transition entails a significant absorption of visible spectrum band from low to high energy. The polydiacetylenes are formed by UV irradiation through the self-assembly of monomer units without need of chemical initiators or catalysts.[1,2]

In the present work, the polymeric system (polydiacetylene, PDA) formed by 10,12-pentacosdiyoic acid (DA) is investigated at the air-water interface in presence of a cationic amphiphilic hemicyanine dye (HP). Mixed monolayers of DA:HP 1:1 were formed by cospreading method, and thus the monolayer was stabilized the air/liquid interface by the electrostatic interactions between DA and HP molecules. The miscibility between both components is shown by Brewster angle microscopy (BAM). Domains with different structure than those registered for pure DA are directly visualized. The photopolymerization of domains in the mixed film leads to the formation of PDA with the alkyl chains of the HP in between the polymeric system. The result is a new polymer with different properties to those described previously for the blue or red forms and additional disaggregation of hemicyanine molecules is detected.

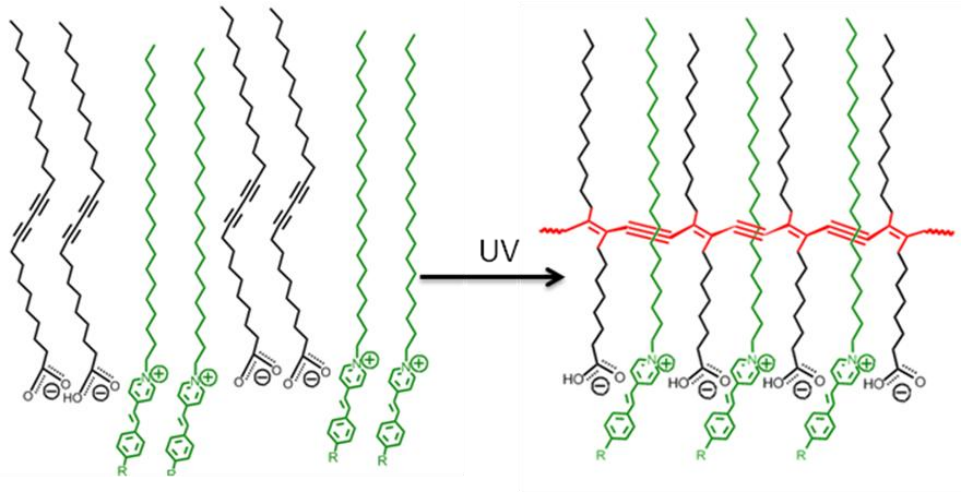

Fig.1. Polydiacetylene-Hemicianine structure

[1] Ahn, D.J.; Lee, S.; Kim, J.-M. *Adv. Funct. Mater*., **2009**, *19*, 1483.
[2] Sun, X.; Chen, T.; Huang, S.; Li, L.; Peng, H. *Chem. Soc. Rev.*, **2010**, *39*, 4244.