"Fe(II) COORDINATION COMPLEXES EXHIBITING SPIN CROSSOVER PHENOMENON (SCO): NEW ASPECTS FOR THE DEVELOPMENT OF NOVEL NANOMATERIALS AS TEMPERATURE SENSORS IN FOOD PACKAGING INDUSTRY"

Z. G. Lada[1,2,*], K. S. Andrikopoulos[1], A. Soto Beobide[1], S. P. Perlepes[1,2], and G. A. Voyiatzis[1]

[1]FORTH/ICE-HT, Stadiou str, Rio-Patras, Greece

[2]Department of Chemistry, University of Patras, Rio-Patras, Greece

*(*zoilada@iceht.forth.gr)*

ABSTRACT

The food quality in terms of the consumers' safety constitutes nowadays a vital issue of great concern. To that end, "smart" food packaging materials exhibiting sensor-type properties, play a key role. Spin-Crossover (SCO) Phenomenon is a well-known phenomenon of a number of coordination complexes.[1-2] One of the main characteristics of SCO complexes, is that they exhibit temperature-dependent drastic colour changes accompanied by spin state conversion. The main focus of our research is the development and the in-depth study of low nuclearity Fe(II) SCO coordination complexes for potential use as sensors in refrigerated food packaging materials.[3]

The coordination complexes developed were characterized using various techniques (Raman, ATR, p-XRD, UV/VIS, SEM) which revealed their morphological, optical and structural properties. Temperature-dependent and low-frequency Raman experiments played a significant role for the meticulous examination of the SCO phenomenon. For practical reasons a second step of our efforts was the incorporation of the same materials in conventional food packaging polymer matrices (PLA, PS) and the verification of their functionality in the composites. Finally, migration release studies of the sensors in food simulants were performed in order to examine the suitability of these materials according to EU regulations on materials used in food packaging.[4]

BIBLIOGRAPHY

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[4] Commission Regulation (EU) No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food: "Testing for 10 days at 40 °C shall cover all storage times at refrigerated and frozen conditions including heating up to 70 °C for up to 2 hours, or heating up to 100 °C for up to 15 minutes."