Compatible/mimetic polymeric materials with biologic substrates with potential medical applications

Abstract

The Ph.D. thesis **Polymeric materials compatible/mimetic with biological substrates with potential medical applications** has the main objective *obtaining and characterizing N-substituted polymerbased materials containing chromophores and/or DNA that can be used for the development of devices with applications in sensors or photonics.* Thus, in accordance with the main objective, the doctoral thesis makes original contributions regarding: (i) optimizing the insertion of N-substituted amide sequences into architectures with specialized response through studies of (co)polymerization that have been developed for two monomers recognized in the development of material systems with medical applications, highlighting particular kinetic and structural aspects and enabling experimental optimisation for the production of favourable supramolecular structures, enabling the taking, storage and transmission of the responses of the medium of use; (ii) improving the response skills of N-substituted N-substituted (co)polymers without/with carbazole derivatives by designing, synthesizing and characterizing new chemical-binding architectures/physical assembly, caracterization which led to the optimization of conformational dimensional and the development of synthesis techniques, proposing, on the basis of established analytical methods (RMN; elemental analysis, UV-Vis spectroscopy; FT-IR; thermal analysis), particular mechanisms; (iii) the development of specialized sensors by optimizing the materials used to obtain electrodes and modifying the electrodes obtained for the purpose of specializing sensory response and by complex research consisting of material-specific analysis and characterization techniques (SEM; XPS; electrochemical studies, etc.) with a view to (a) optimisation the production of electrospun polymer fibers required in the production of (bio)flexible sensors and (b) designing the technology for the production of sensors for the detection and quantification of small molecules, biosensors for the determination of enzymatic activity, respectively for the detection of genetic mutations by functionalization of new platforms obtained from electrospun polymer fibers.

The doctoral thesis, supported by projects from the national research plan, has demonstrated its validity by 6 publications and 13 communications (11 oral presentations and 2 poster presentations) at national and international scientific events.