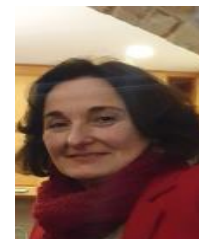


Development of poly (n-vinyl-2-pyrrolidone) hydrogels containing nano-silver and laponite clay for modulation of neomycin

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Abstract

These Biomaterials widely used in biomedicine as wound dressings are composed by hydrogels. They offer ideal conditions for wound treatment, such as maintaining the wound environment humid, autolytic debridement, accelerated healing, ability to absorb large amounts of fluids without losing their physical integrity, drug release in a controlled manner protecting infected wounds that are constantly exposed to environment contaminated with microorganisms. These dressings are formed by one or more polymeric components which, when cross-linked, form three-dimensional networks. They have a high degree of flexibility that is very similar to natural living tissues. The general objective of this work was to synthesize by radiation hydrogel membranes containing PVP, PEG, agar, RD laponite in a neomycin and nanosilver release system that promotes a synergistic action between these two antimicrobial agents. Membranes with different concentrations of polymer matrix / clay were produced by irradiation at a dose of 25 kGy of gamma 60Co source, and characterized by techniques: swelling analysis, thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), tensile tests, parallel plate rheometry. It can be seen that G' and G'' are approximately parallel within the studied range. G' is greater than G'' and both showed little frequency dependence. This performance is the expected for the gels, in which the elastic behavior of the sample predominates over its viscous behavior. The clay-polymer interactions increases gel cross-linking, which provides an increase in their mechanical properties. In parallel, nanoparticles of silver coupled to clay (Laponite) were synthesized in which their properties were verified by means of UV-Vis, MET, ICP-OES and microbiological activity. The study of the microbiological activity of AgNPs-Laponite nanoparticles on the reduction of microorganisms in culture indicated that most of the nanoparticles, synthesized from the reduction of silver ions on the surface of Laponite, have activity

against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli*, *Candida albicans*.

Biography:

Duclerc F Parra has completed his PhD at the age of 30 years from Unicamp University after 10 years of industrial work in elastomer development and postdoctoral studies from Sao Paulo University, Chemistry Institute. She is the Researcher and leader of team at Polymer Laboratory of Chemical and Environmental Center – Nuclear and Energy Research Institute, IPEN/CNEN(Brazil). She has published more than 75 papers in reputed journals and 20 book chapters, always collaborating with student's formation in postgraduate doctoral program.

Speaker Publications:

1. Mechanical properties and water vapor transmission in some blends of cassava starch edible films; DF Parra, CC Tadini, P Ponce, AB Lugão; Carbohydrate polymers 58 (4), 475-481
2. Enhancement of the luminescent intensity of the novel system containing Eu^{3+} - β -diketonate complex doped in the epoxy resin; DF Parra, HF Brito, JDR Matos, LC Dias; Journal of applied polymer science 83 (12), 2716-2726
3. Influence of poly (ethylene glycol) on the thermal, mechanical, morphological, physical-chemical and biodegradation properties of poly (3-hydroxybutyrate); DF Parra, J Fusaro, F Gaboardi, DS Rosa; Polymer degradation and stability 91 (9), 1954-1959;

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