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PREPARATION OF NEW CONTROLLED RELEASE SYSTEMS FOR METAL NANOBIOHERBICIDES

The results of the encapsulation of a nanobioherbicide formulation of *Puccina* sp.- Ag NPs using the drip extrusion technique and chitosan as encapsulating polymer are presented. The synthesis of Ag nanoparticles was obtained by chemical reduction method. The Ag NPs were characterized by visual inspection, ultraviolet-visible spectroscopy and transmission electron microscopy (TEM). The nanobioherbicide precursor solutions containing sodium tripolyphosphate (TPP) as a gelling agent were prepared under ambient conditions and rigorous stirring. By varying the percentage of TPP 4.0, 3.0, 2.0 and 1.0% in the precursor solution containing the nanobioherbicide, it was possible to prepare nanobioherbicide capsules with sizes of 4 mm and to control the porosity of the shells. Characterization by optical microscopy showed the formation of well-defined and homogeneous microcapsules. SEM analysis revealed the formation of different morphologies in the cross section of the shells depending on the TPP concentration. UV-Vis spectroscopy results revealed the presence of the nanobioherbicide in the capsules. Finally, the nanobioherbicide *Puccina* sp.- Ag NPs was applied on Amaranthus retroflexus in order to observe the herbicidal effect.

Keywords

Ag nanoparticles, Encapsulation, Nanobioherbicides

Reference

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Author approval

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