

Abstract

# Molecularly Imprinted Polymers for TNT Analogues. Development of Electrochemical TNT Biosensors <sup>†</sup>

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Trinitrotoluene (TNT) is a widely employed explosive compound; for that reason, an electrochemical sensor able to perform on-field measurements could be an interesting tool. In this work, a molecularly imprinted polymer using the TNT analogue DNP as a template is developed. Next, the obtained MIP is chemically characterized towards DNP and TNT.

MIPs synthesis was done following the protocol by co-precipitation using methacrylic acid (MAA) as a monomer, ethylene glycol ethylene glycol dimethylacrylate (EGDMA) as a crosslinker, azobisisobutyronitrile (AIBN) as a radical indicator and ethanol as a solvent. Template removal was performed with a Soxhlet using MeOH:HAc. Control non-imprinted polymers (NIPs) were also synthesized for the purpose of comparison.

Microscopy studies were performed to confirm similar morphologies among these polymers; the material was also characterized by a Scatchard plot to calculate the  $K_b$  (the affinity constant) and  $B_{max}$  (maximum amount bound) values.

The presented work reports a polymeric material able to capture TNT and DNP and its preliminary results once implemented as a recognition element in a voltammetric biosensor.



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