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Synthesis and characterization of polythiophene and silver nanocomposites

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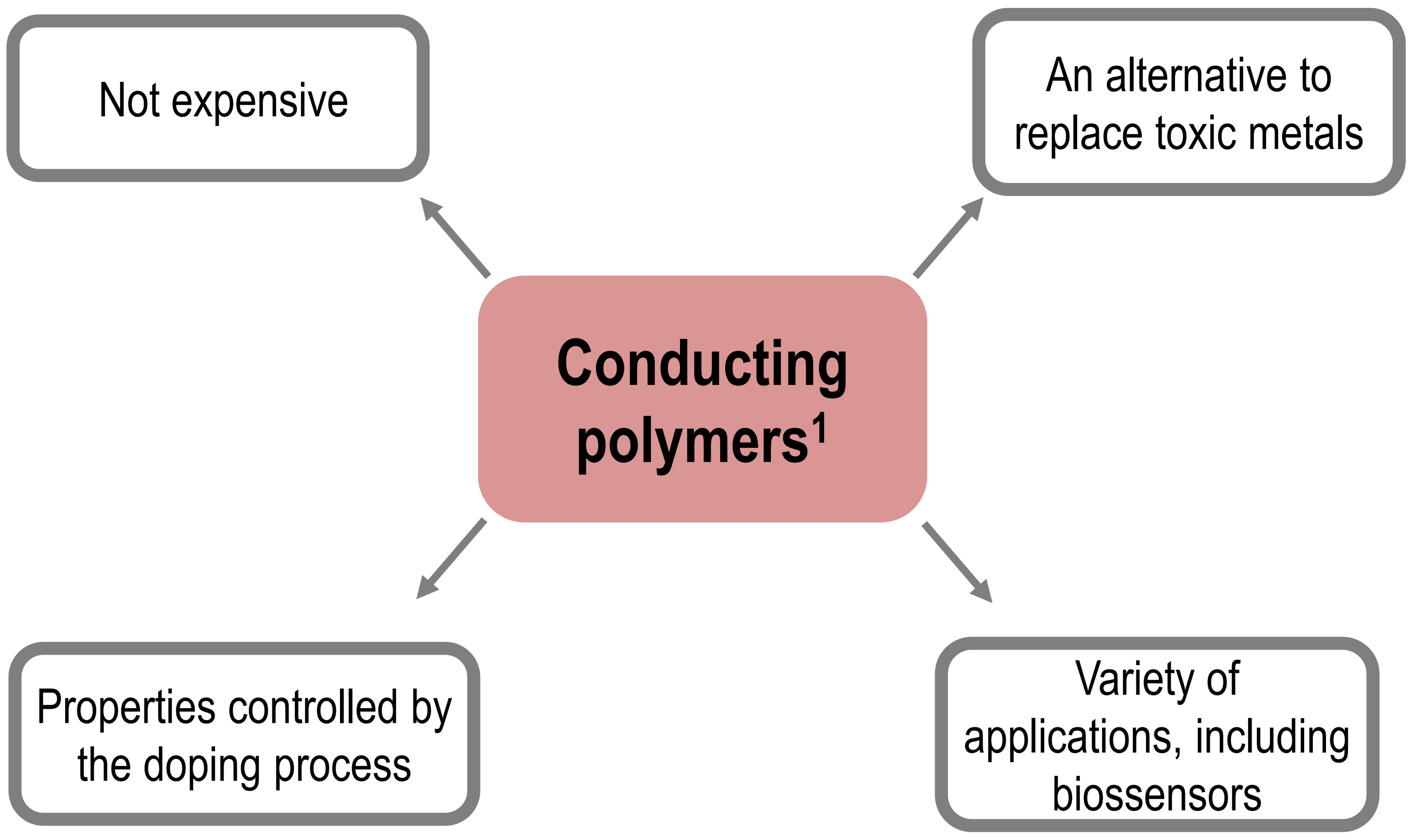
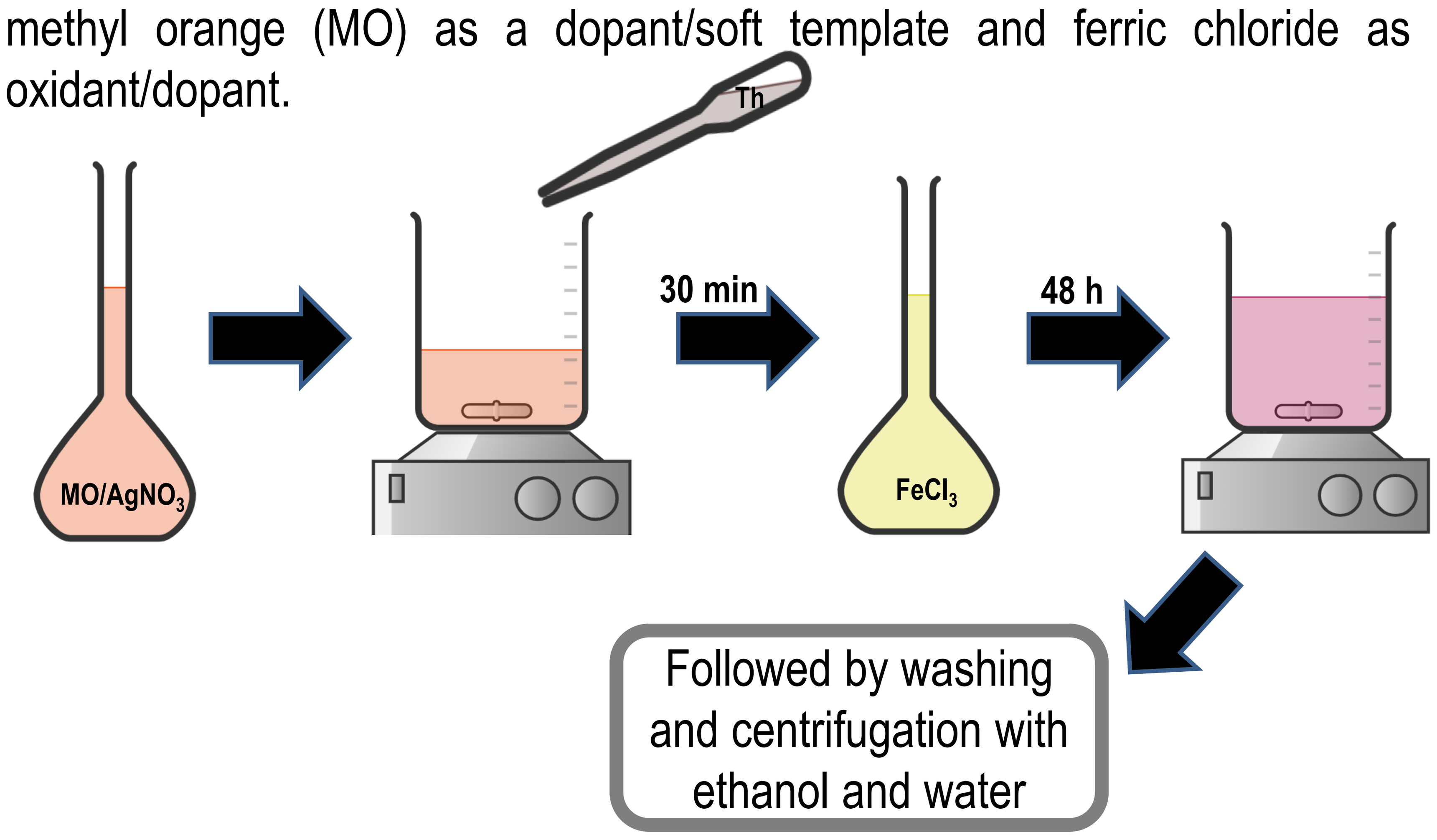
INTRODUCTION



METHODOLOGY

In this work, nanocomposites of polythiophene (PTh) and silver nanoparticles (AgNPs) were synthesized in situ using a chemical procedure with $AgNO_3$, methyl orange (MO) as a dopant/soft template and ferric chloride as an oxidant/dopant.



RESULTS

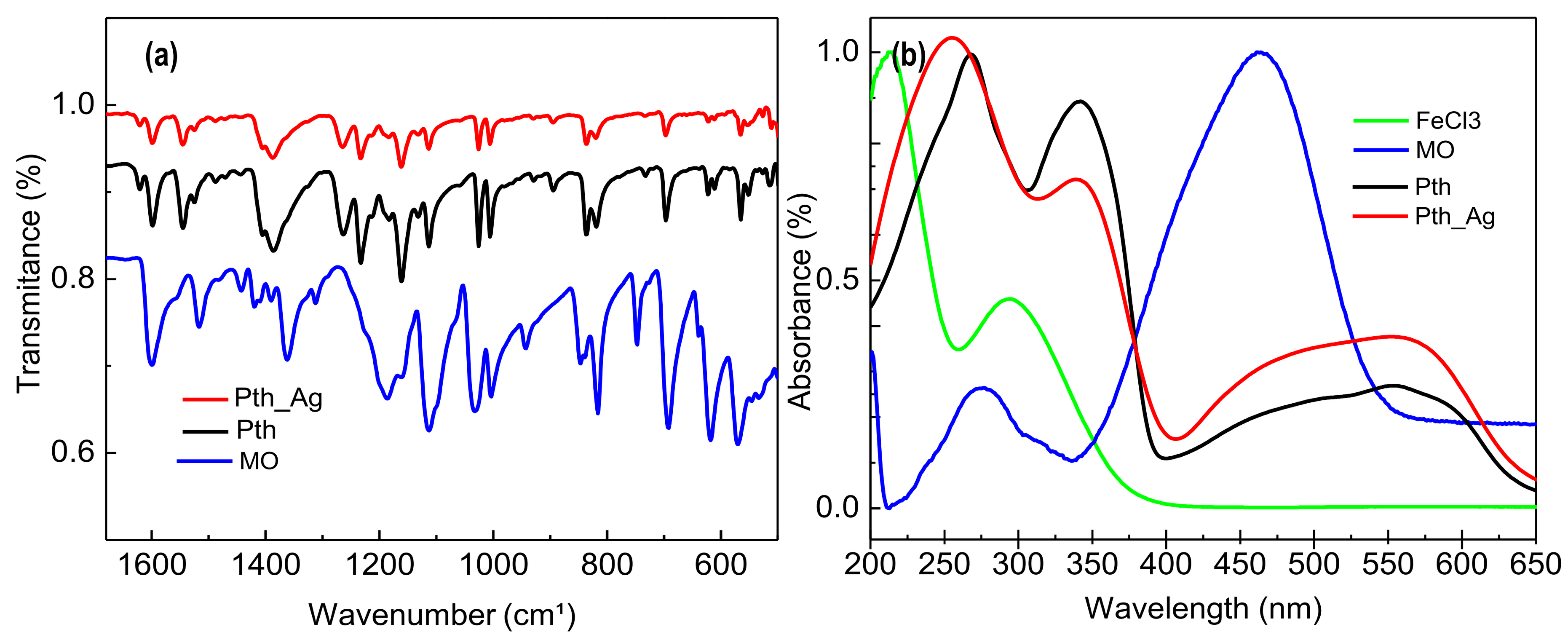


Figure 1: (a) FTIR and (b) UV-Visible spectra.

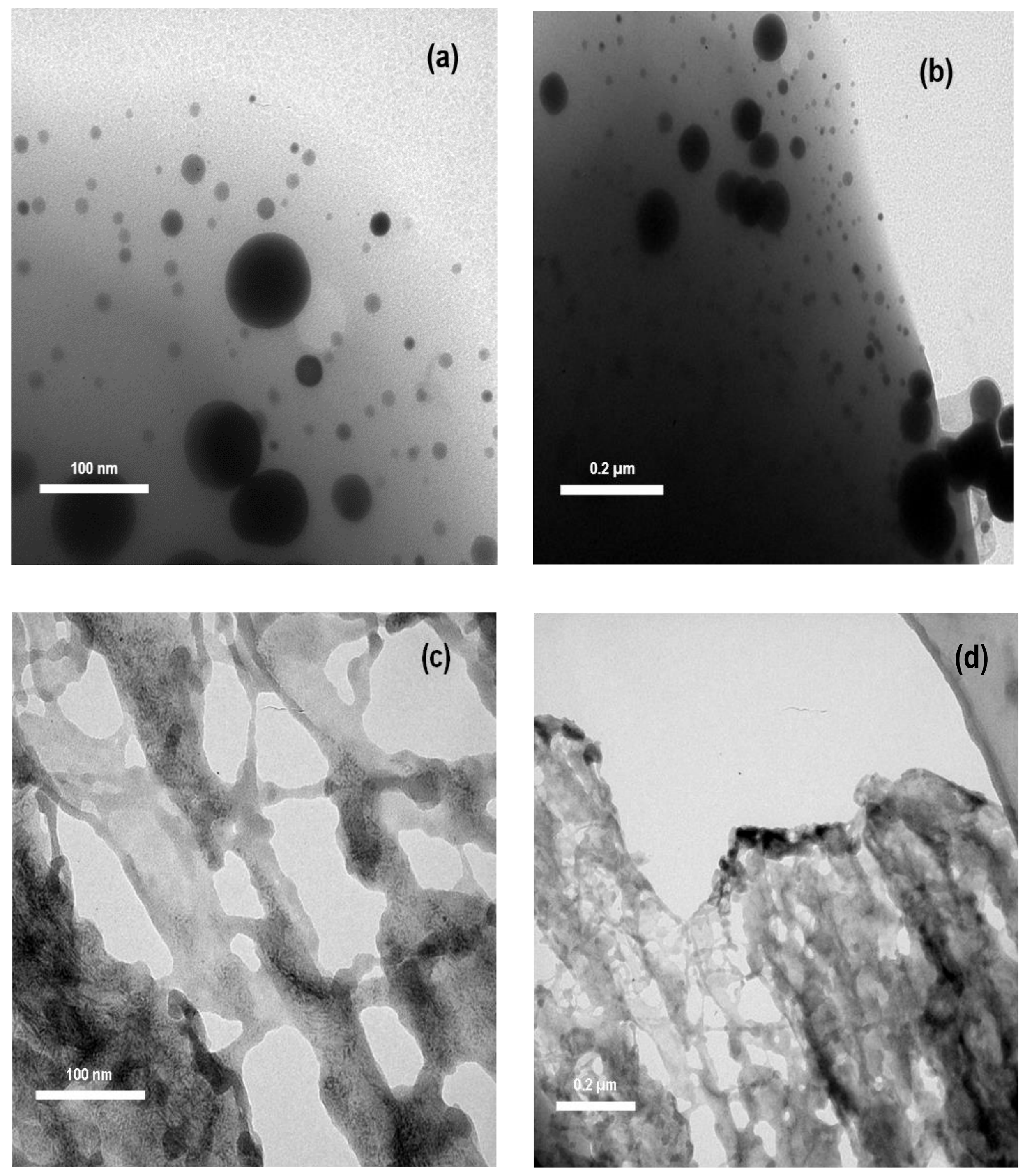
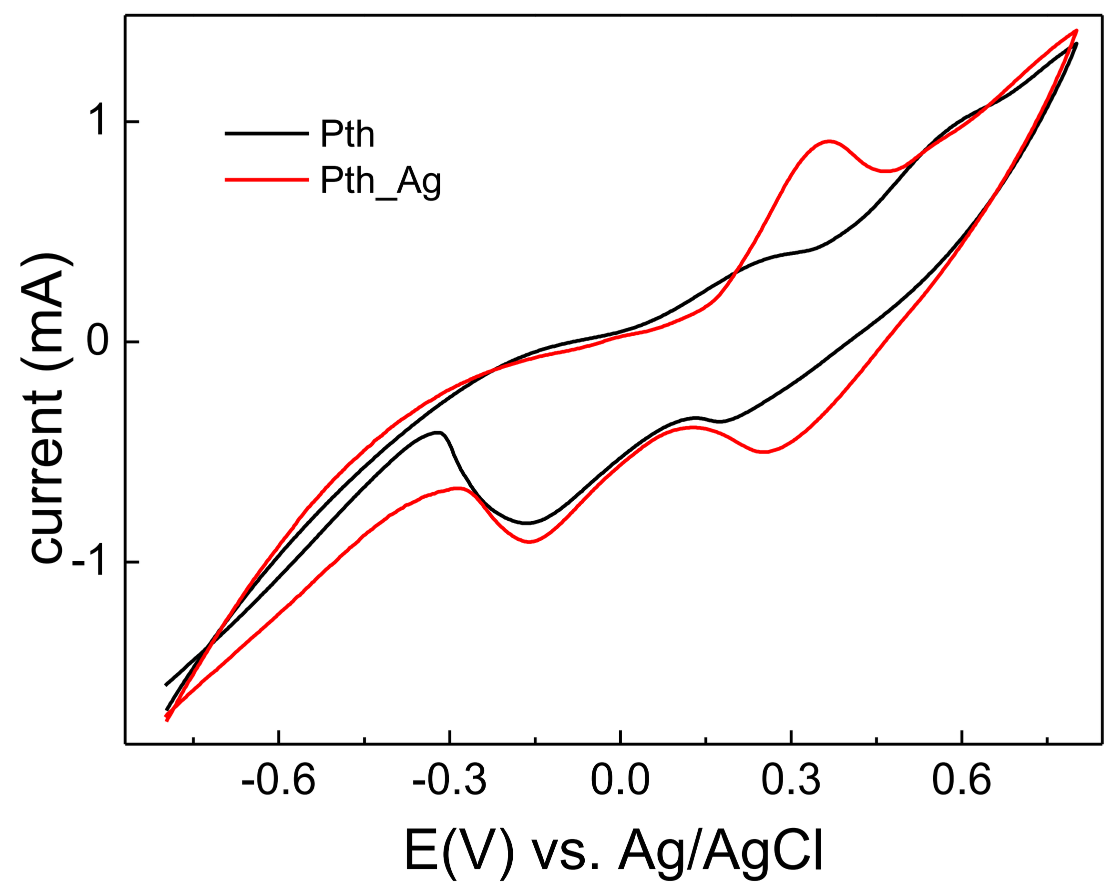


Figure 2: Transmission electron microscopy (TEM) images showing differences in morphology for samples with (a and b) and without silver nanoparticles (c and d)



- The nanocomposite presents morphology driven by the presence of AgNPs
- The samples presented smaller optical band gap compared to literature (ca. 1.85 eV against 2.0 eV).[2]

Figure 3: Cyclic voltammetry in KNO_3 0.1 mol.L^{-1}. Scan rate 20 mV.s^{-1}.

- Qualitative results from I x V data show a decrease in resistivity for the nanocomposite.

REFERENCES

[1] J. Roncali, Chem. Rev. 92, 4, 711-738 (1992)

[2] Chiang, C. K., Fincher Jr, C., Park, Y. W., Heeger, A. J., Shirakawa, H., Louis, E. J., Gau, S. C., MacDiarmid, A. G. Electrical conductivity in doped polyacetylene. Physical Review Letters, 39, 1098-101, 1977.

ACKNOWLEDGMENTS

CAPES CNPq UFRGS CMM UFRGS