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PREPARATION AND CHARACTERIZATION OF AN ANTIBACTERIAL PLA/PPY CONDUCTOR COMPOSITE

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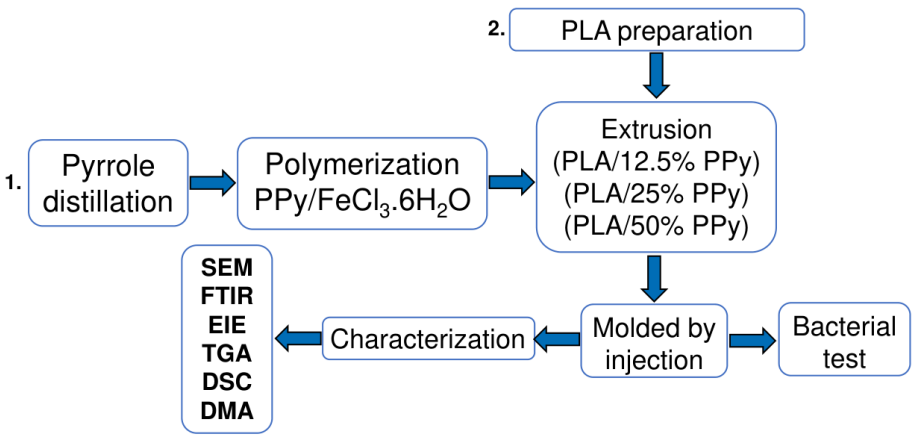
Introduction

Polypyrrole has several applications, such as sensors and biosensors, supercapacitors, bactericidal agents, remediation, water and textile protection. The use of antimicrobial agents is strongly motivated in different areas such as medicine and food.

Objectives

Preparation and characterization of PPy/polylactic acid (PLA) composites for thermal processing, and evaluation of their antibacterial potential against Escherichia coli and Staphylococcus aureus.

Methodology



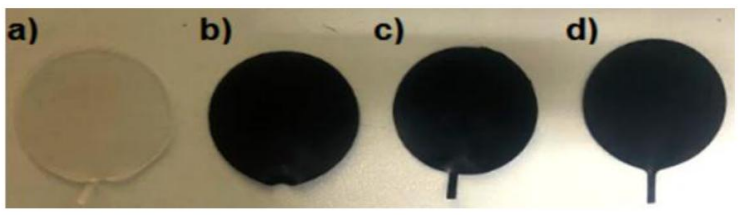


Figure 1. (a) PLA; (b) PLA/12.5% PPy; (c) PLA/25% PPy; (d) PLA/50% PPy.

Results and Discussion

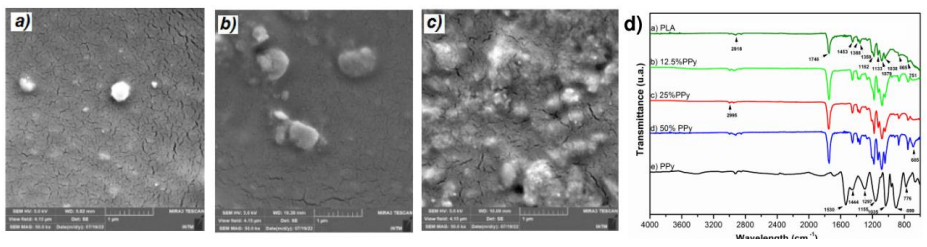


Figure 2. SEM: (a) PLA/12.5% PPy; (b) PLA/25% PPy; (c) PLA/50% PPy. (d) FTIR.

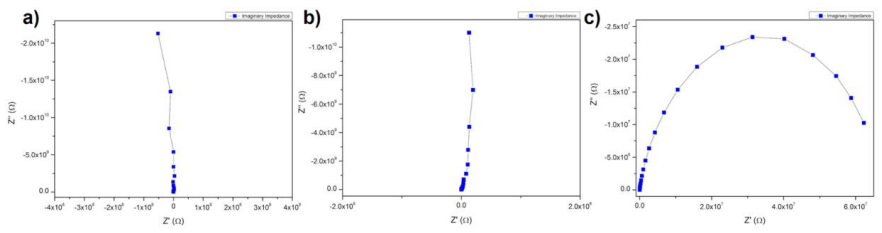


Figure 3. EIE: (a) PLA/12.5% PPy; (b) PLA/25% PPy; (c) PLA/50% PPy.

Acknowledgements

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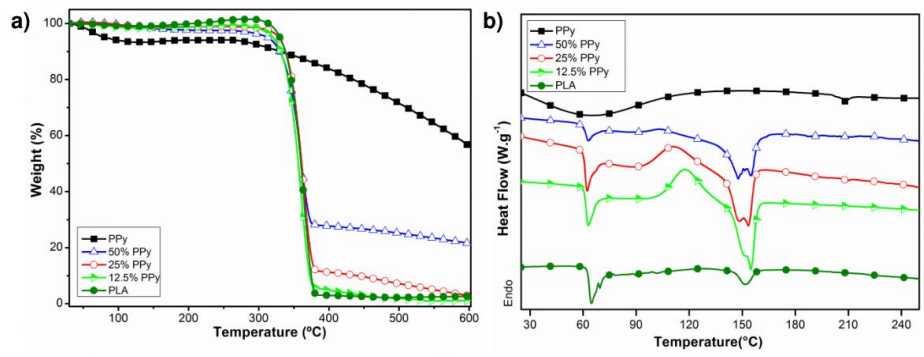


Figure 4. (a) TGA and (b) DSC: PPy, PLA/50% PPy, PLA/25% PPy, PLA/12.5% PPy and PLA.

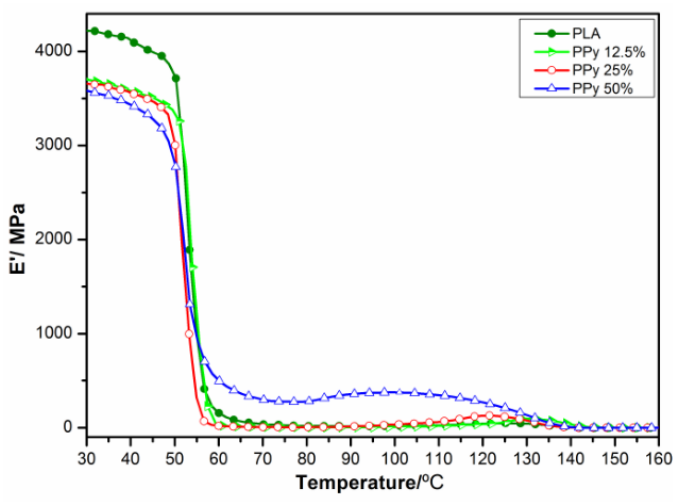


Figure 5. DMA: PLA, PLA/12.5% PPy, PLA/25% PPy, PLA/50% PPy and PPy.

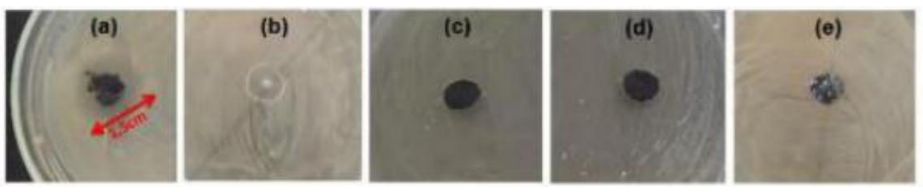


Figure 6. Escherichia coli: (a) PPy; (b) PLA; (c) PLA/12.5% PPy; (d) PLA/25% PPy; (e) PLA/50% PPy.

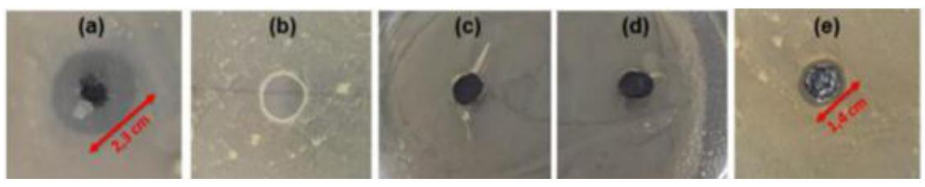


Figure 7. Staphylococcus aureus: (a) PPy; (b) PLA; (c) PLA/12.5% PPy; (d) PLA/25% PPy; (e) PLA/50% PPy.

Conclusions

For Staphylococcus aureus, the composite with 50% polypyrrole showed bacterial inhibition, demonstrating potential for application in packaging.

References

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