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ELECTROPHORETIC DEPOSITION OF CHITOSAN AND Zn-DOPED MESOPOROUS BIOACTIVE GLASS NANOPARTICLES (ZnMBGNs) ON NiTiNOL WIRES

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Introduction

NiTiNOL: used as medical stents.

- Biocompatible;
- Shape memory effect;
- Superelastic [1];
- Prone to biofilm formation.
  - Development of **coatings** for biofilm prevention.
- Chitosan: biocompatible coating material, adhesion enhancer, antibacterial properties [2].
- ZnMBGNs: biocompatible ceramic, high surface area, ion-induced antibacterial activity [3].

Objectives

- To obtain an organic/inorganic coating of chitosan and ZnMBGNs on NiTiNOL wires with antibacterial potential using **electrophoretic deposition (EPD).**
  - EPD: deposition of surface-charged particles in a medium upon an externally applied electric field.
- To obtain a coating that is **well-adhered, homogeneous and stable.**

Materials & Methods

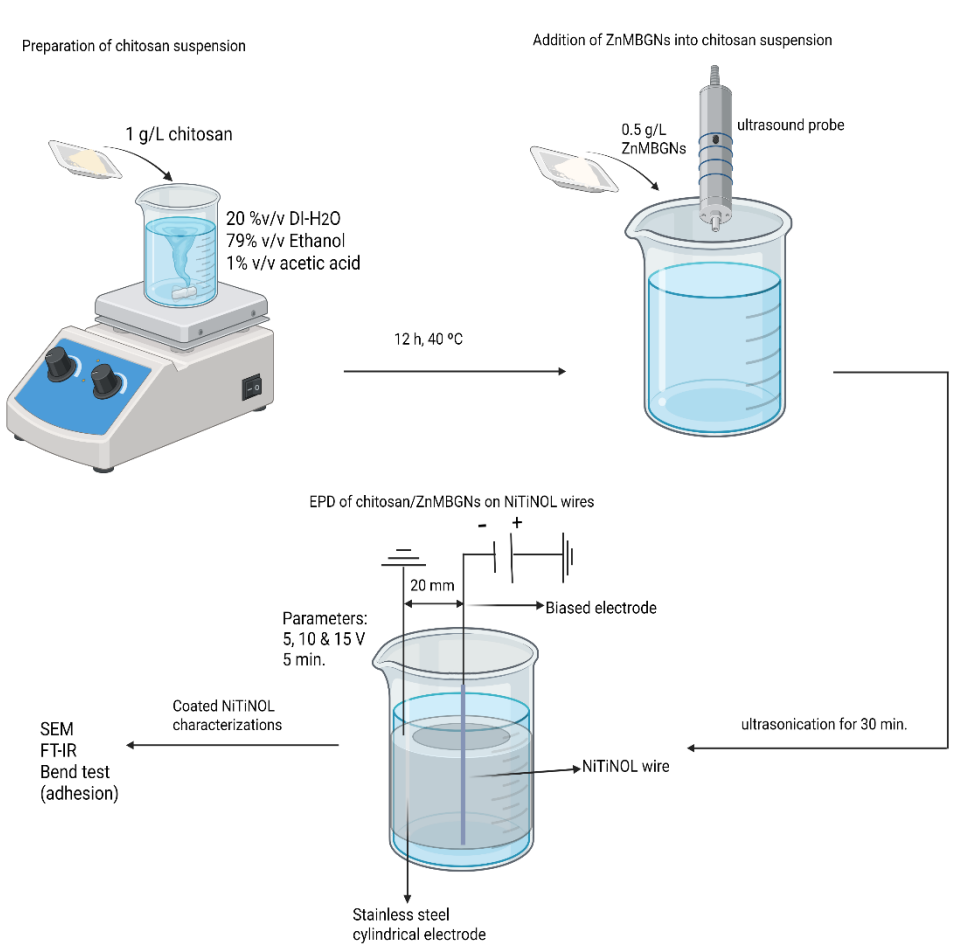


Figure 1: experimental procedure.

Results

- 10 V and 15 V coatings showed delamination.
  - 5 V produced thin and homogeneous coatings.

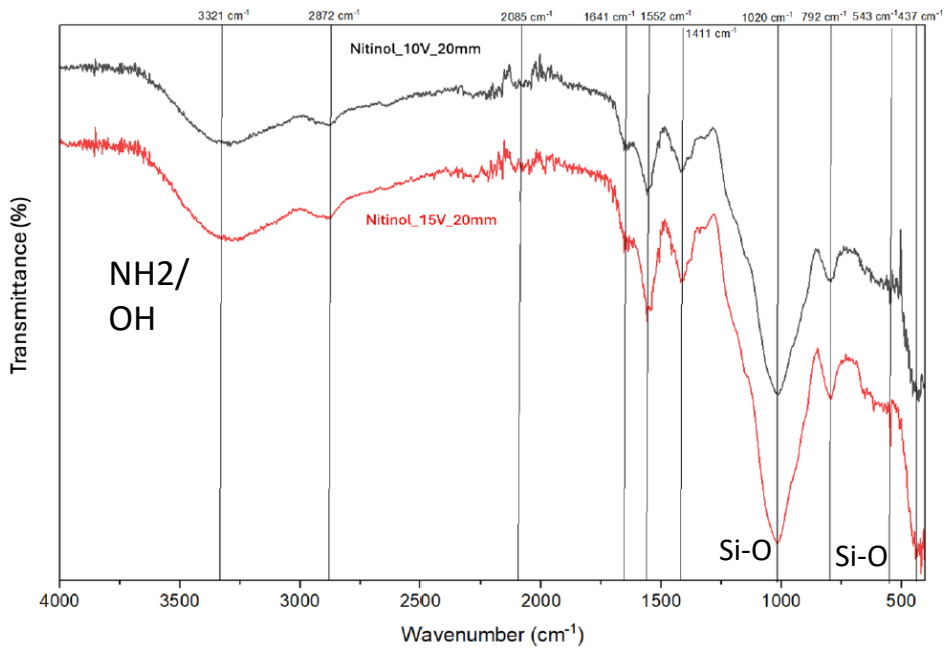


Figure 2: FT-IR spectra of the samples.

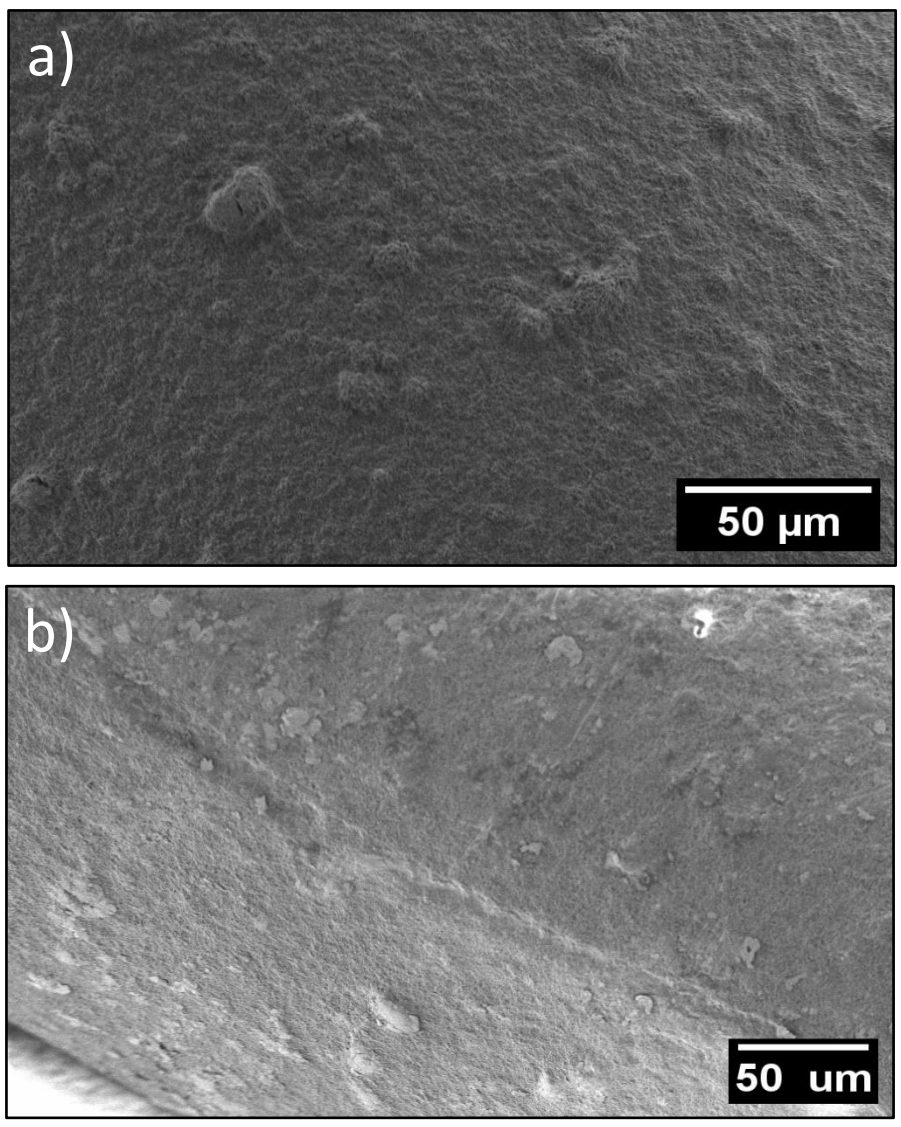


Figure 3: SEM of a) 5 V deposition and b) 5 V after 10 bends.

Conclusions

- 5 V EPD produced a homogeneous, thin, and adhesive organic/inorganic coating for potential antibacterial applications.

References & Acknowledgements

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