The prospects for the use of smarts textiles in the electronic field

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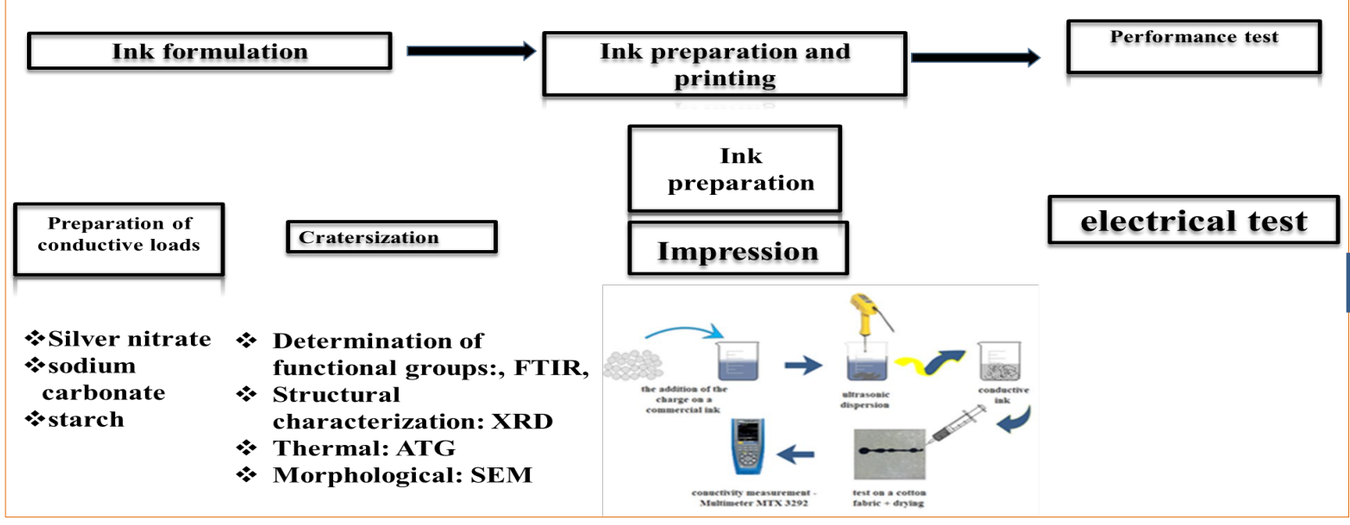
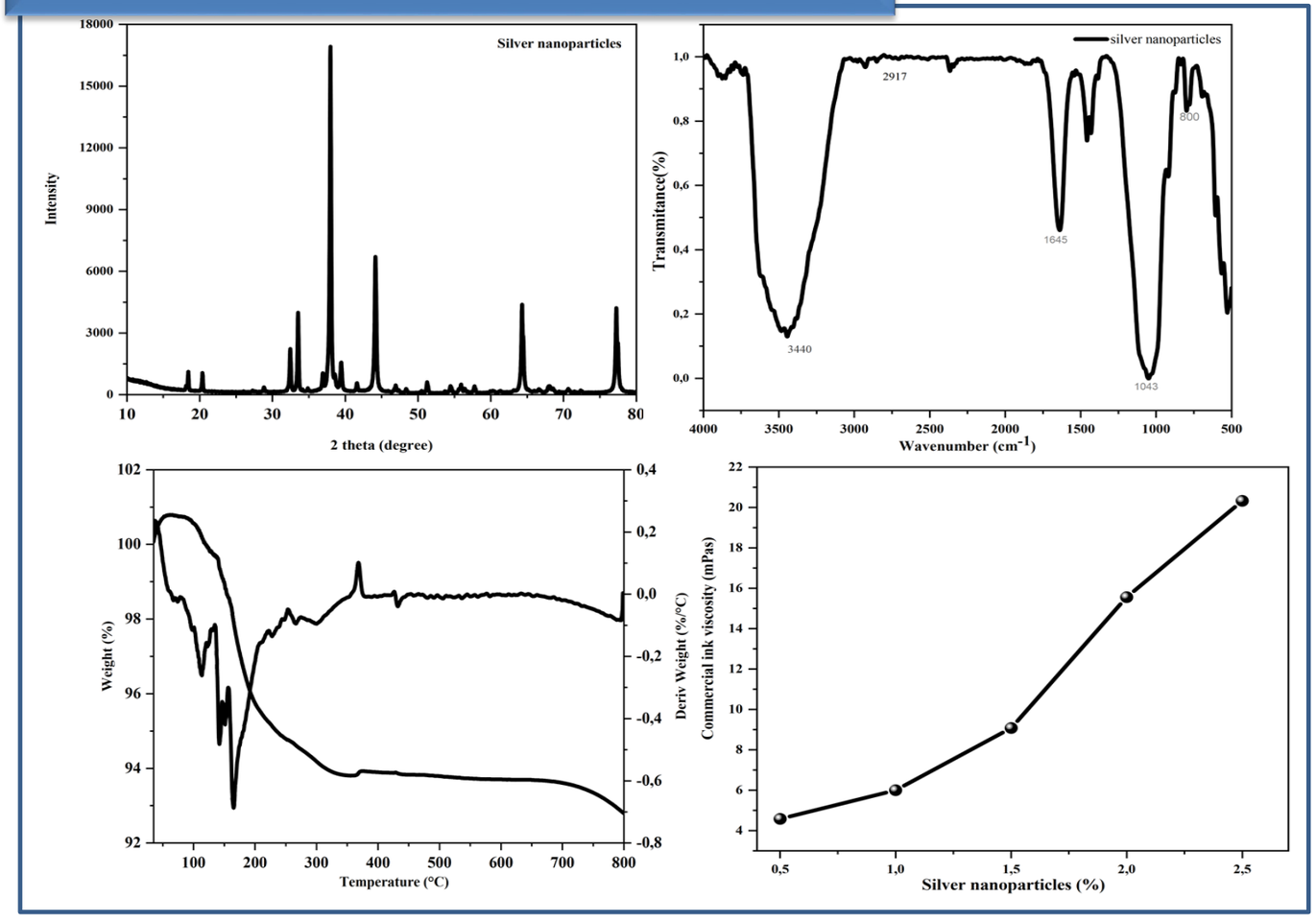
Introduction/ objectif

- To ensure a healthy aging environment, smart clothing has been proposed to monitor the physical conditions for elderly or homecare patients by wireless communication [1].
- As an essential component for the realization of flexible electronics, multifunctional electronic textiles (E-textiles) are still struggling to achieve controllable print accuracy, excellent flexibility, decent washability and simple manufacturing. The printing process for conductive ink plays an important role in the manufacture of electronic textiles and is also the main source of printing defects. Our objective is to bring back the preparation of fully flexible and washable textile-based conductive circuits by applying inkjet printing technology based on a new conductive ink based on nanomaterials such as silver nanoparticules [2]

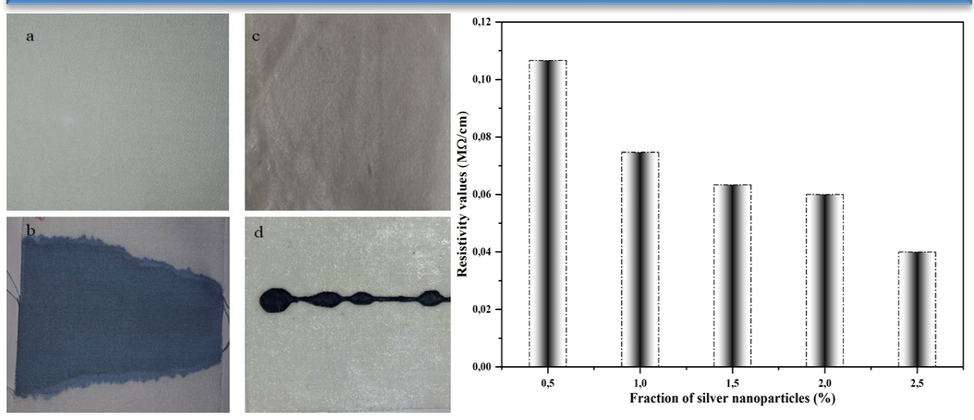
Preparation of conductive ink

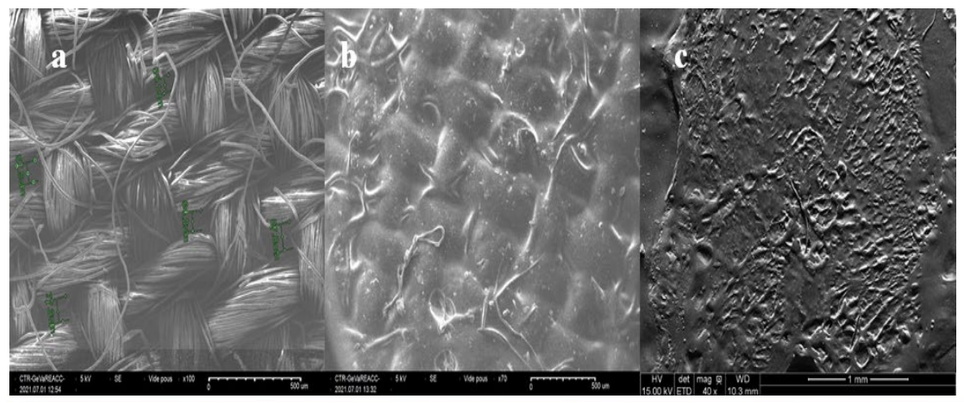


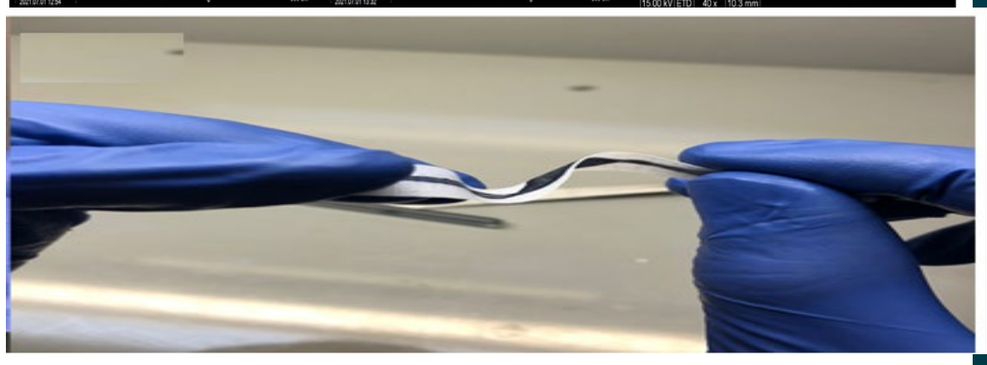
Characterization



Application







Conclusion

Silver nanoparticles were rapidly synthesized using a soft reduction system with starch as a reductant, enabling large-scale and cost-effective production. The nanoparticles were sintered at 150°C, resulting in face-centred cubic structure with an average size of 32.29 nm, and when dispersed in commercial ink and printed, the features exhibited a resistivity of 0.04 MΩ/cm with 2.5%wt of AgNPs, with potential for further conductivity enhancement through optimizing the sintering temperature

[1] Springer International Publishing. https://doi.org/10.1007/978-3-031-20168-4_24

[2] *Nature Electronics*. (n.d.). Retrieved May 19, 2023, from https://www.nature.com/articles/s41928-022-00723-z