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Polyaniline Composites Obtained from Pickering Emulsion Stabilized by Silica Modified Nanoparticles

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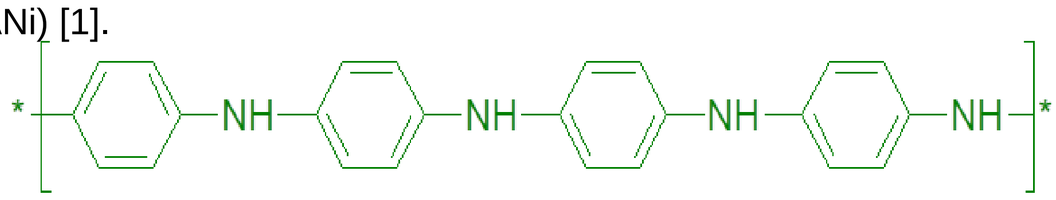
INTRODUCTION & AIM

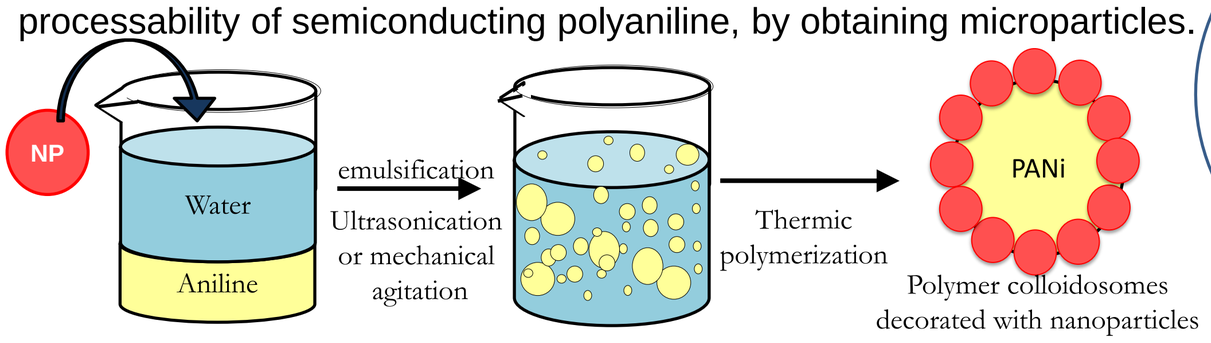
One the most versatile semiconducting polymers owing to its unique advantages like good environmental stability, ease to prepare and reversible acid/base, doping/dedoping chemistry is polyaniline (PANi) [1].



DISADVANTAGES OF PANi

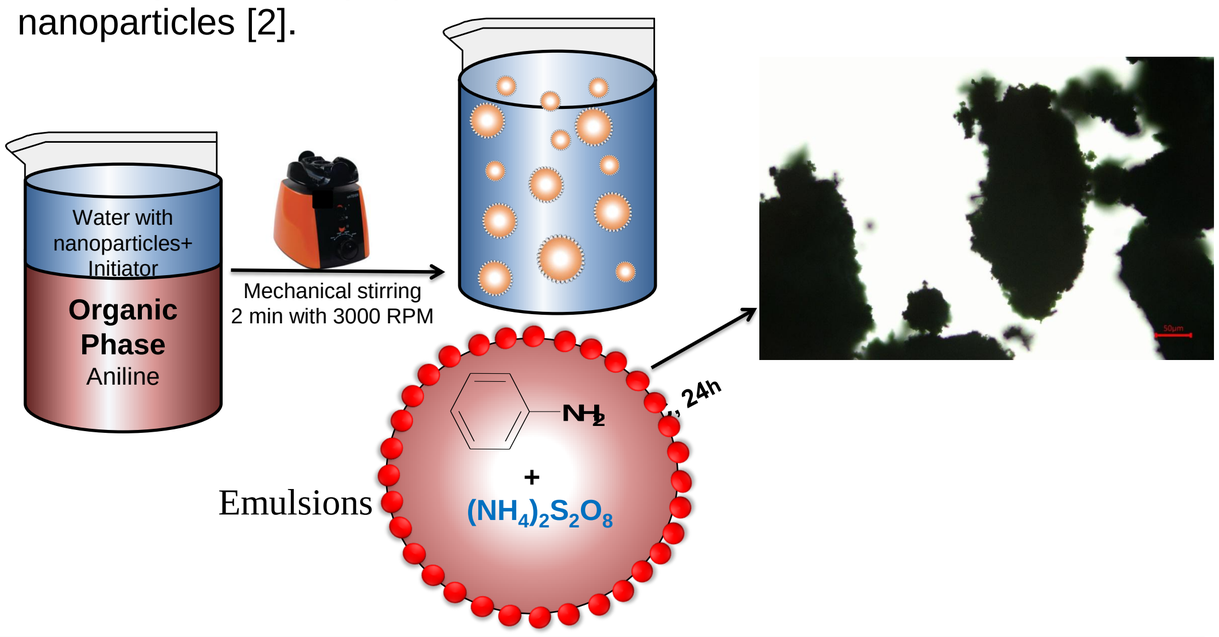
- **INTRACTABLE**
- **INSOLUBLE**
- **INFUSIBLE**

In this work we employ the Pickering Emulsion Polymerization Technology (PEmPTech) as a facile method for improving the processability of semiconducting polyaniline, by obtaining microparticles.



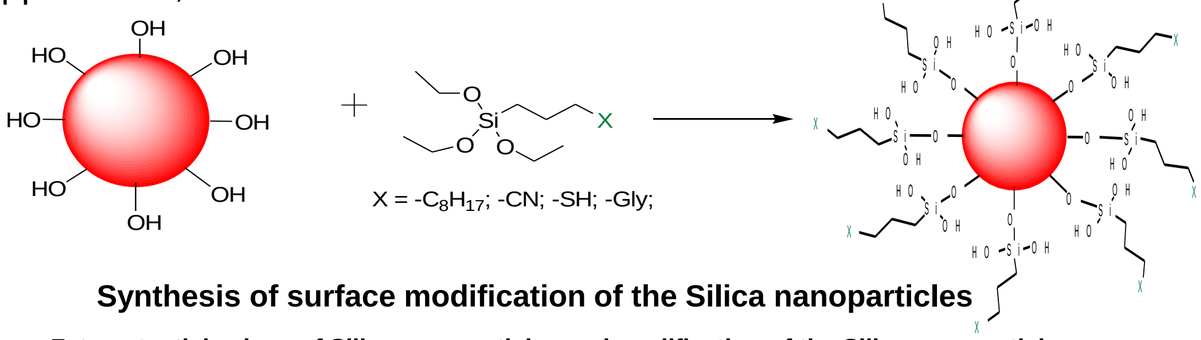
METHOD

Pickering emulsion polymerization and immobilization of modified Silica nanoparticles [2].



RESULTS & DISCUSSION

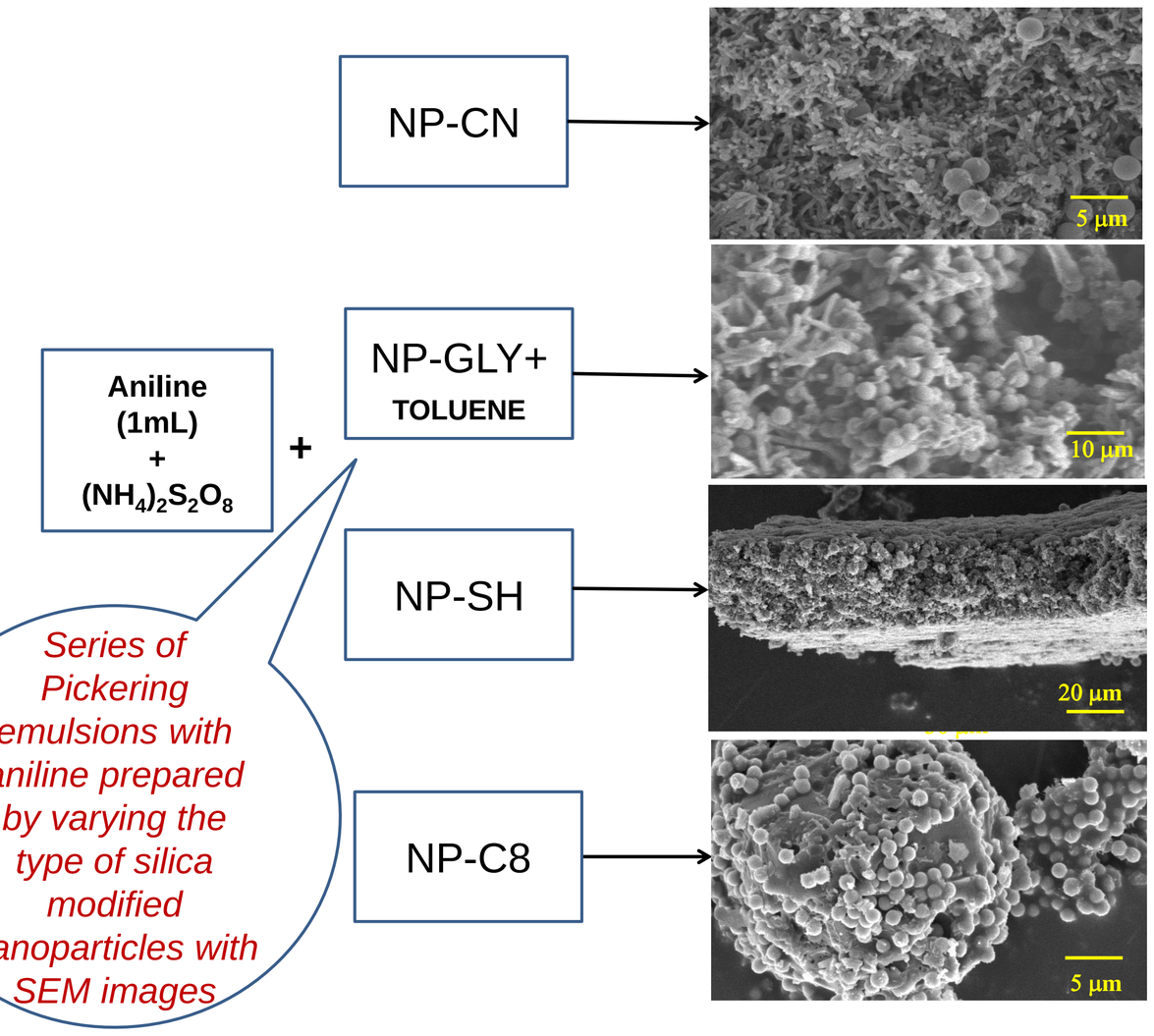
We have emulsified aniline in the presence of an initiator and in the presence of different types of silica modified nanoparticles [3]. We have obtained microparticles of PANi that are semiconducting and are dispersible in aqueous solvent, thus improving the polymer's processability. The synthesis method that we used is simple in comparison with other techniques and has a great potential for many applications, such as electronics devices, sensors, fuel cells, biomedical applications,etc.

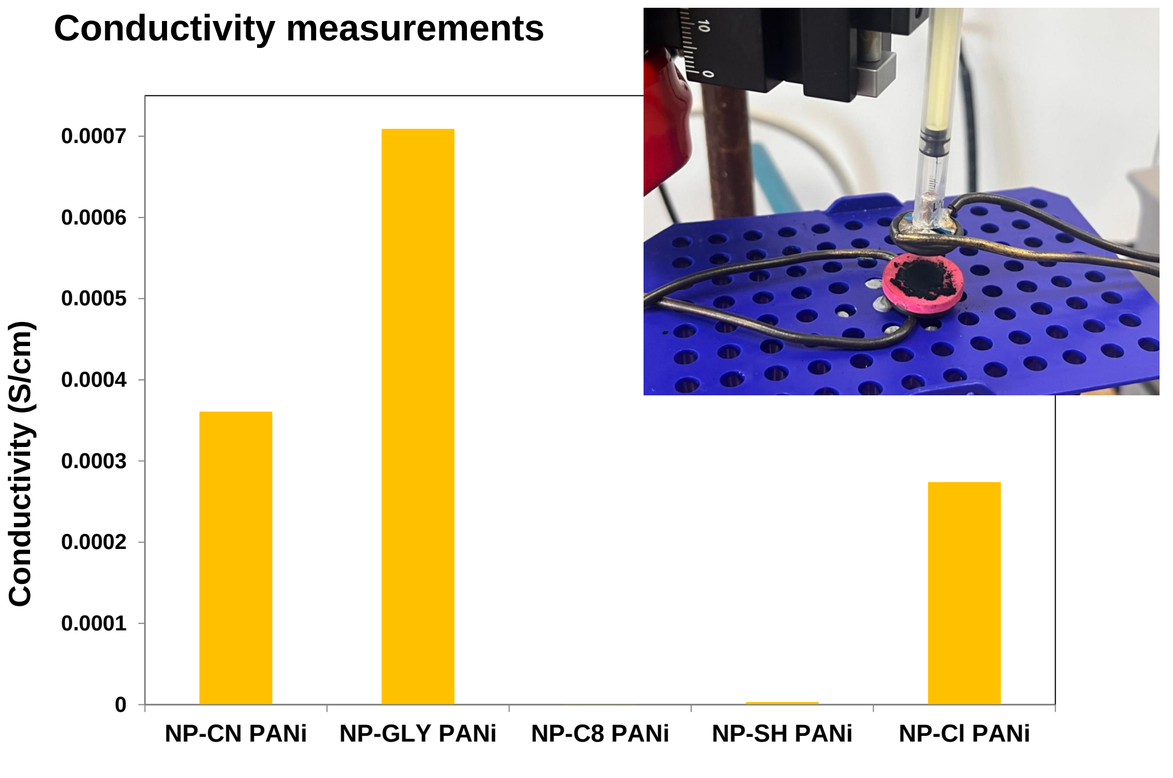


Synthesis of surface modification of the Silica nanoparticles

Zeta potential values of Silica nanoparticles and modification of the Silica nanoparticles

Samples	NP-OH	NP-CN	NP-GLY	NP-SH	NP-C8
Zeta potential	-49.7±1.3	-45.5±0.5	-44.2±0.3	-51.7±0.2	-47.4±0.7





CONCLUSION

The new polyaniline composites were successfully prepared by PEmPTech. The type of the modified silica nanoparticles added in the emulsion had a distinct effect on the morphology of composites. The method reported in this study can be used for the preparation of other composite nanostructures based on polyaniline.

FUTURE WORK / REFERENCES

Perspectives: The use of these composites for the design of sensors different electronic devices.

References:

1. A.-M. Solonaru, M. Asandulesa, A. Honciuc, *Polymers,* 2022, 14, 2149;
2. A. Honciuc, A.-M. Solonaru, M. Honciuc, *ACS Appl. Polym. Mater.* 2023, 5, 8012−8022;
3. A. Honciuc, O.-I. Negru, *Nanomaterials*, 2021, *11*, 3200.