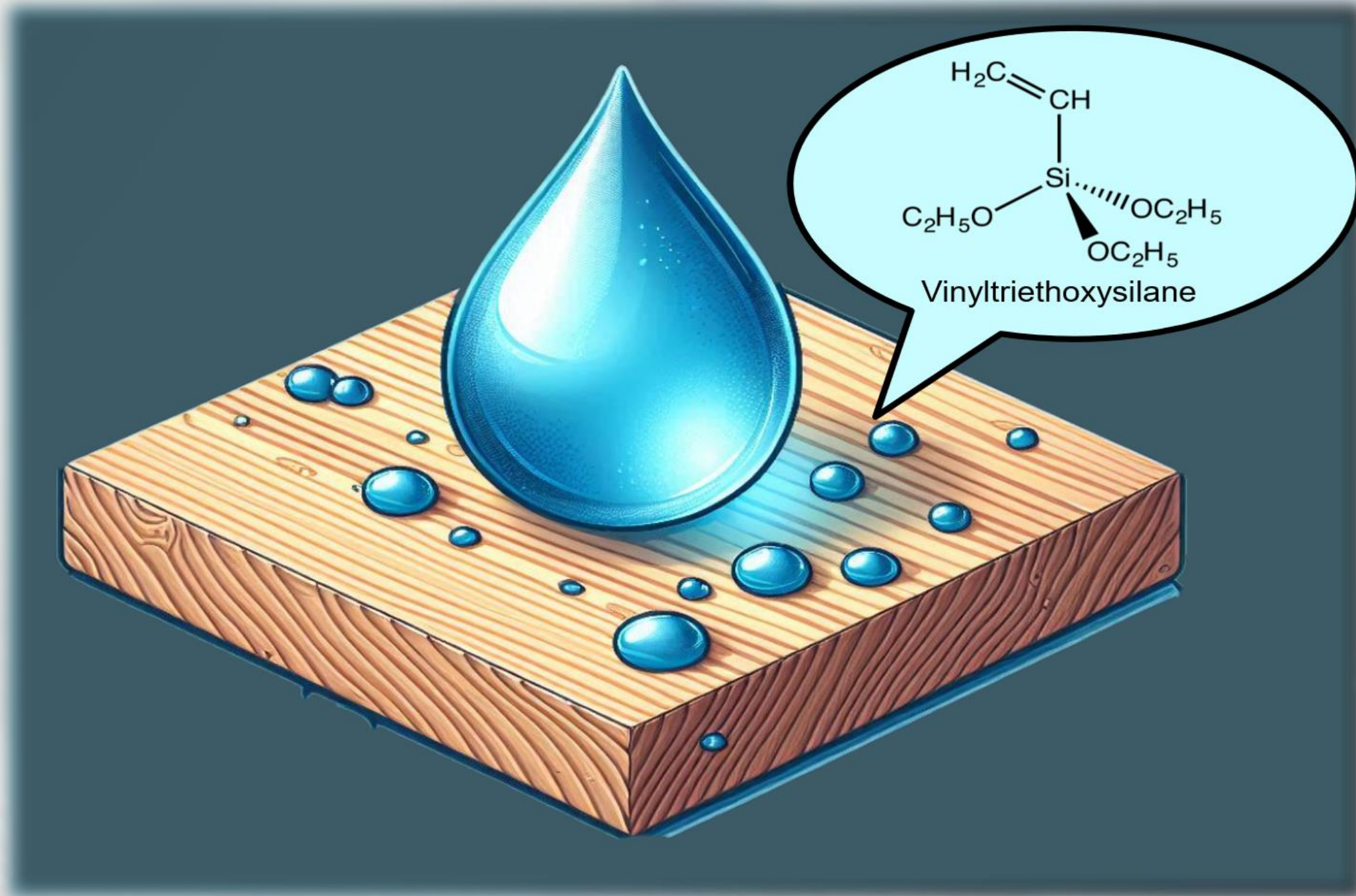


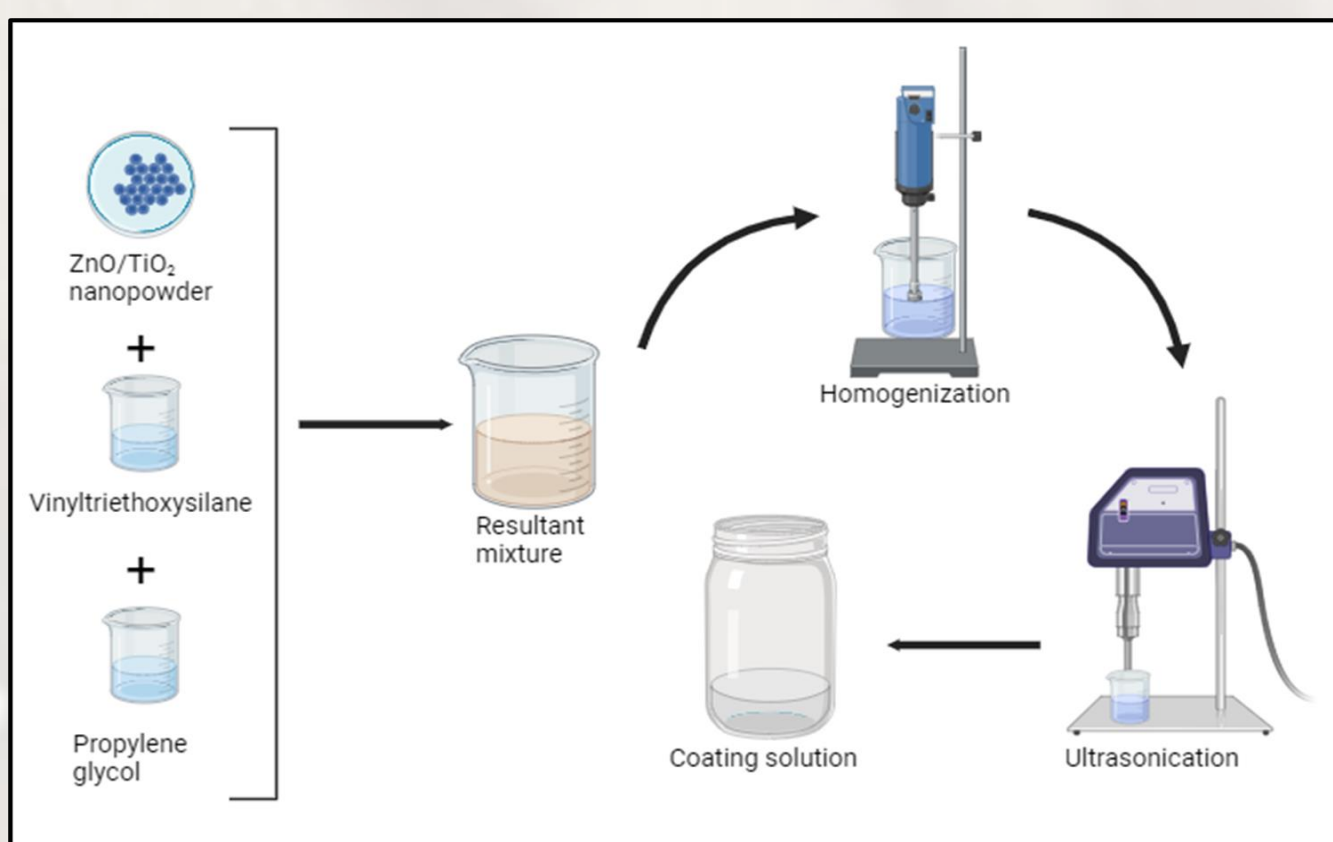
INTRODUCTION & OBJECTIVES

Wood is a renewable and versatile lignocellulosic material used for a variety of outdoor and indoor purposes. However, it suffers degradation majorly by UV-light and moisture uptake. The degraded wood loses its strength property, dimensional stability, aesthetic appeal and also becomes more prone to fungal attack. Therefore, it is necessary to protect wood from the above mentioned agents of degradation. This study mainly aims to formulate one such coating solution, which exhibits superhydrophobicity and also provide UV-resistance.



The concept of a superhydrophobic surface is inspired by the fine papillae on the surface of a lotus leaf. It involves a two-step process, the first step is to induce surface roughness, followed by treatment of the surface with some low surface energy material.

METHODOLOGY

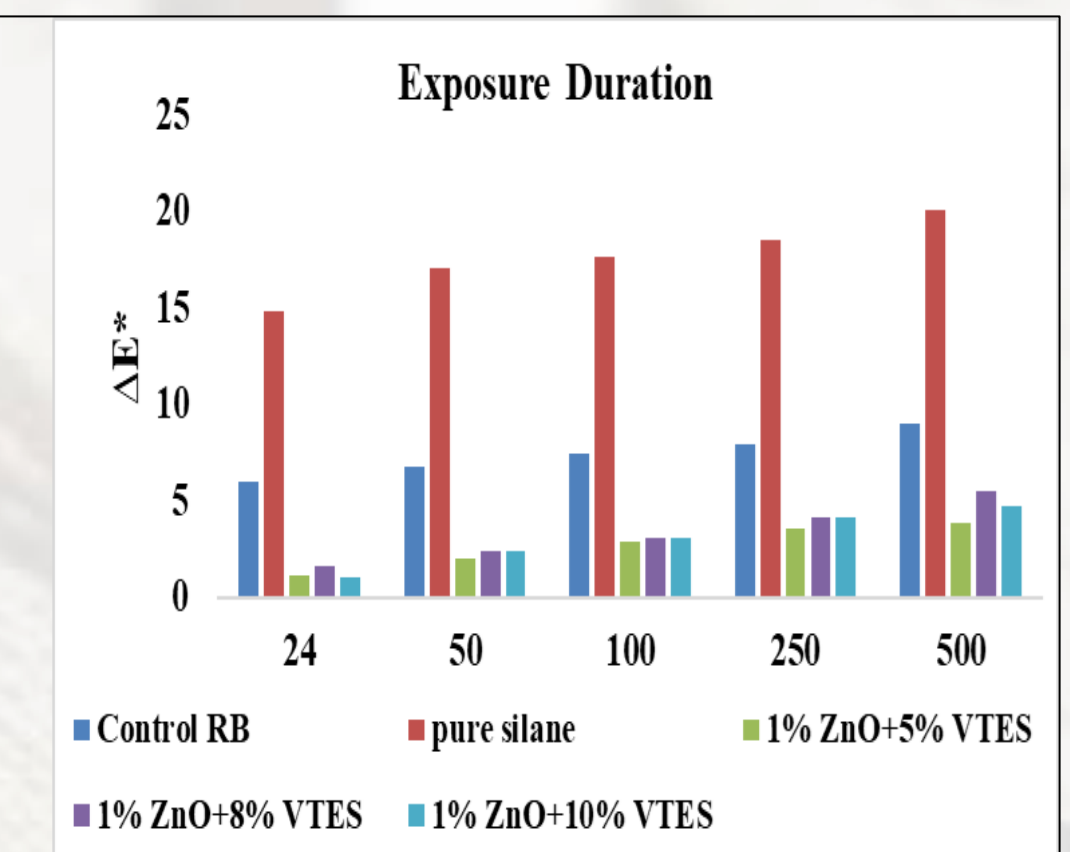
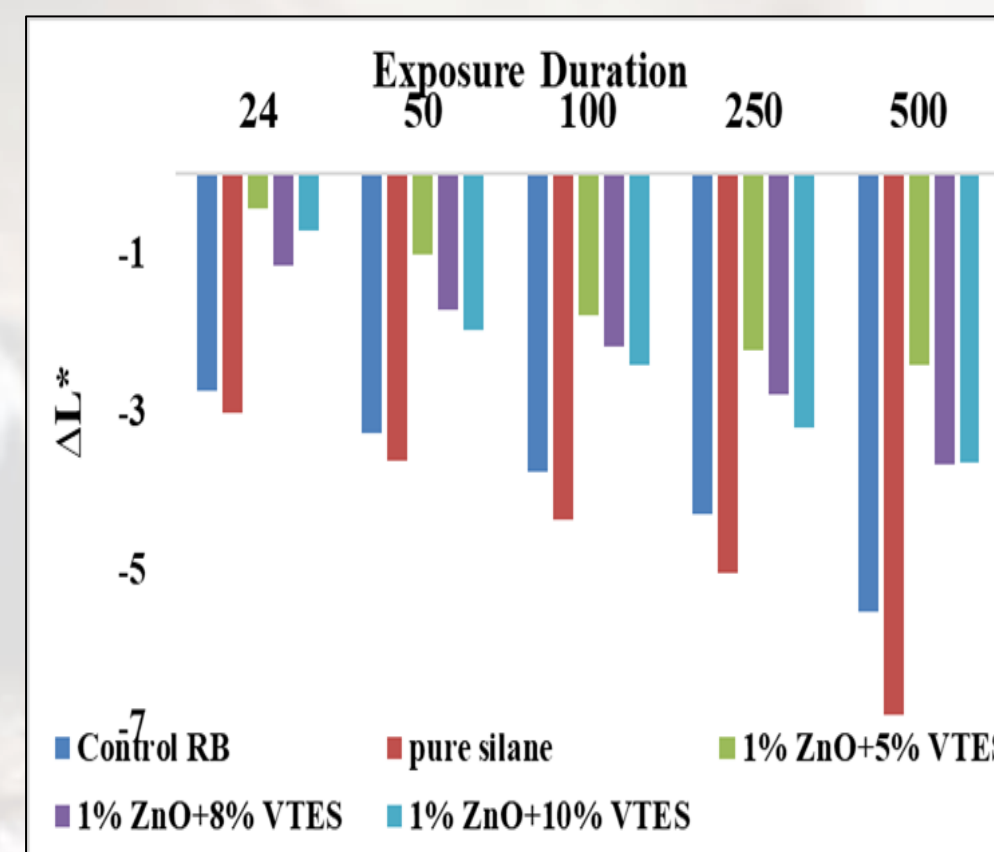
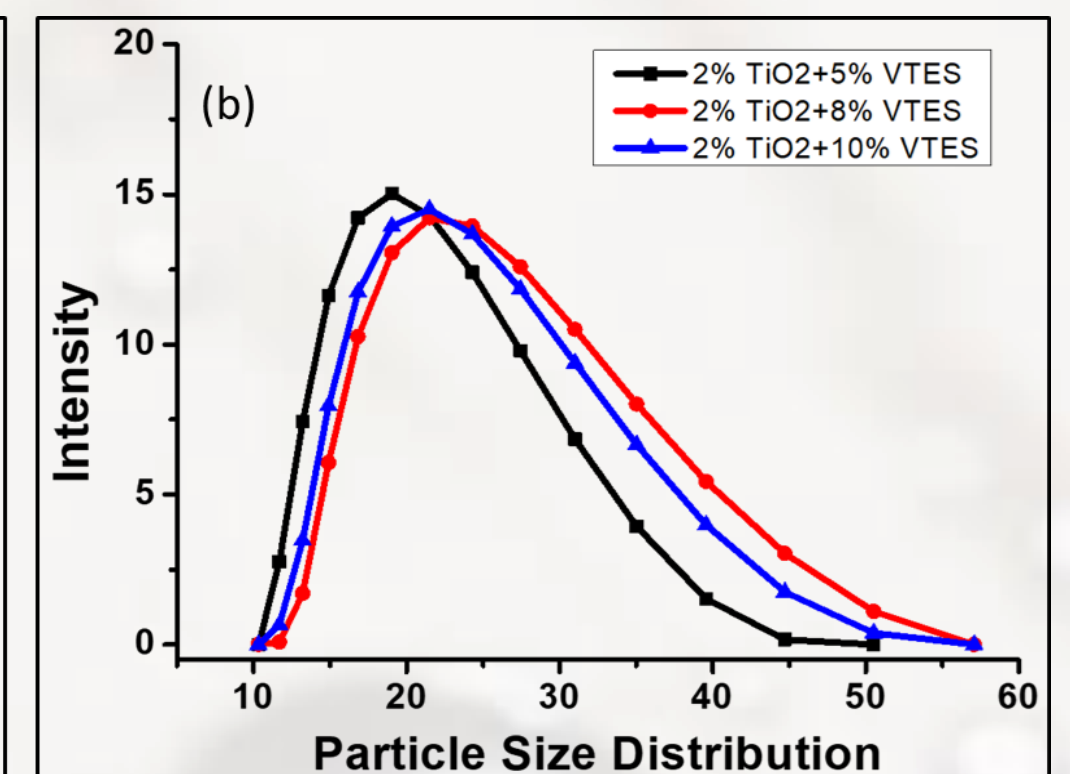
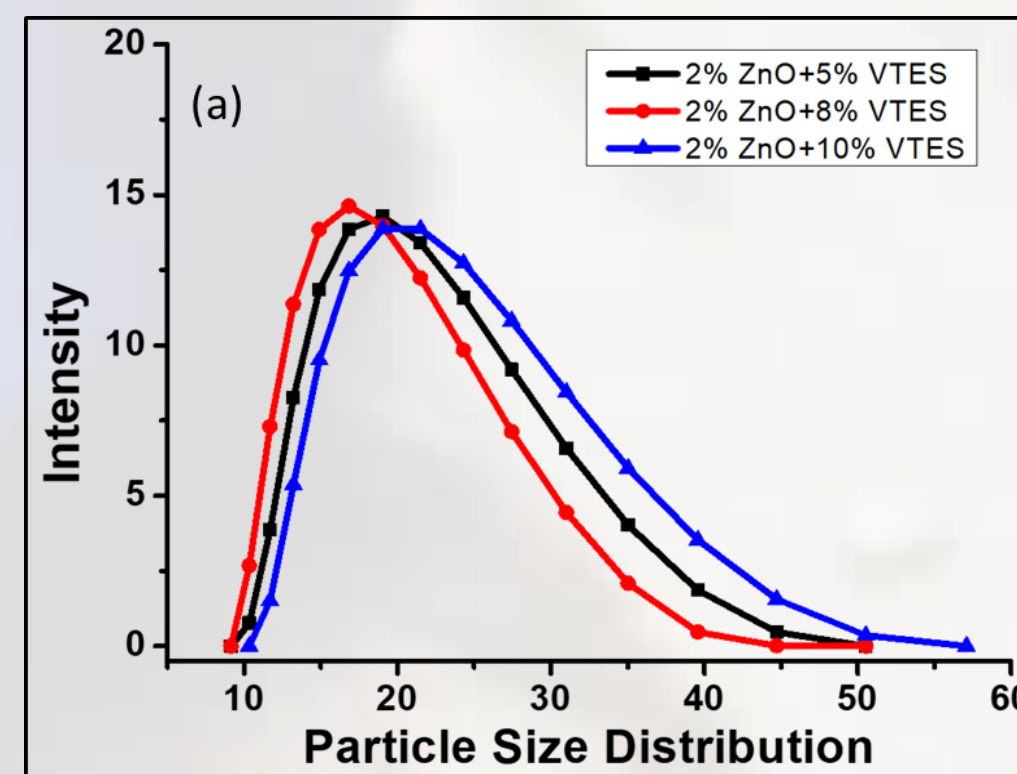
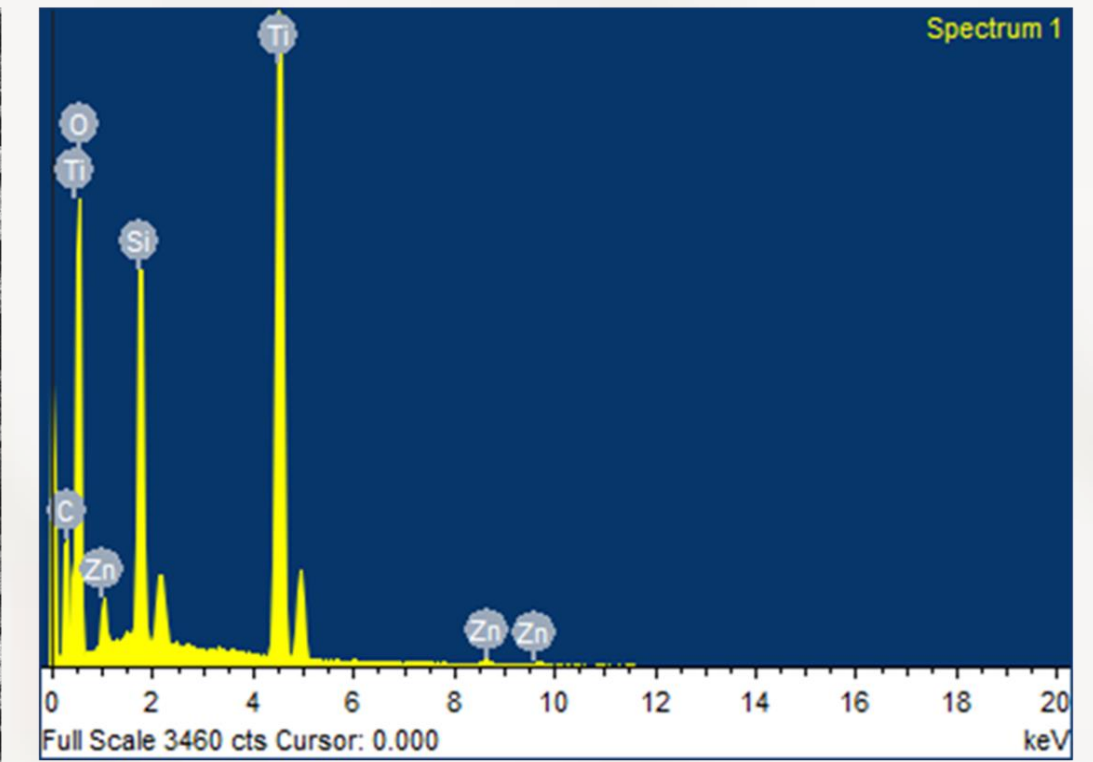
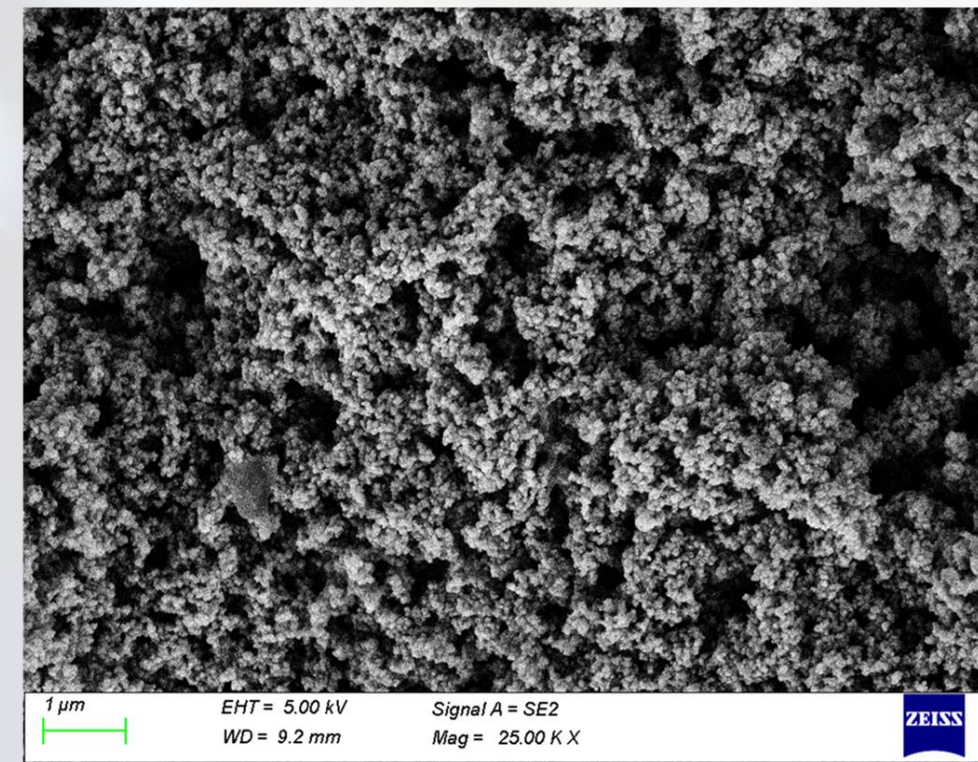


A simple one-step methodology was used to prepare the nano-dispersions. The prepared nano-dispersions were then characterized by different techniques, like DLS, SEM, Optical Microscopy.

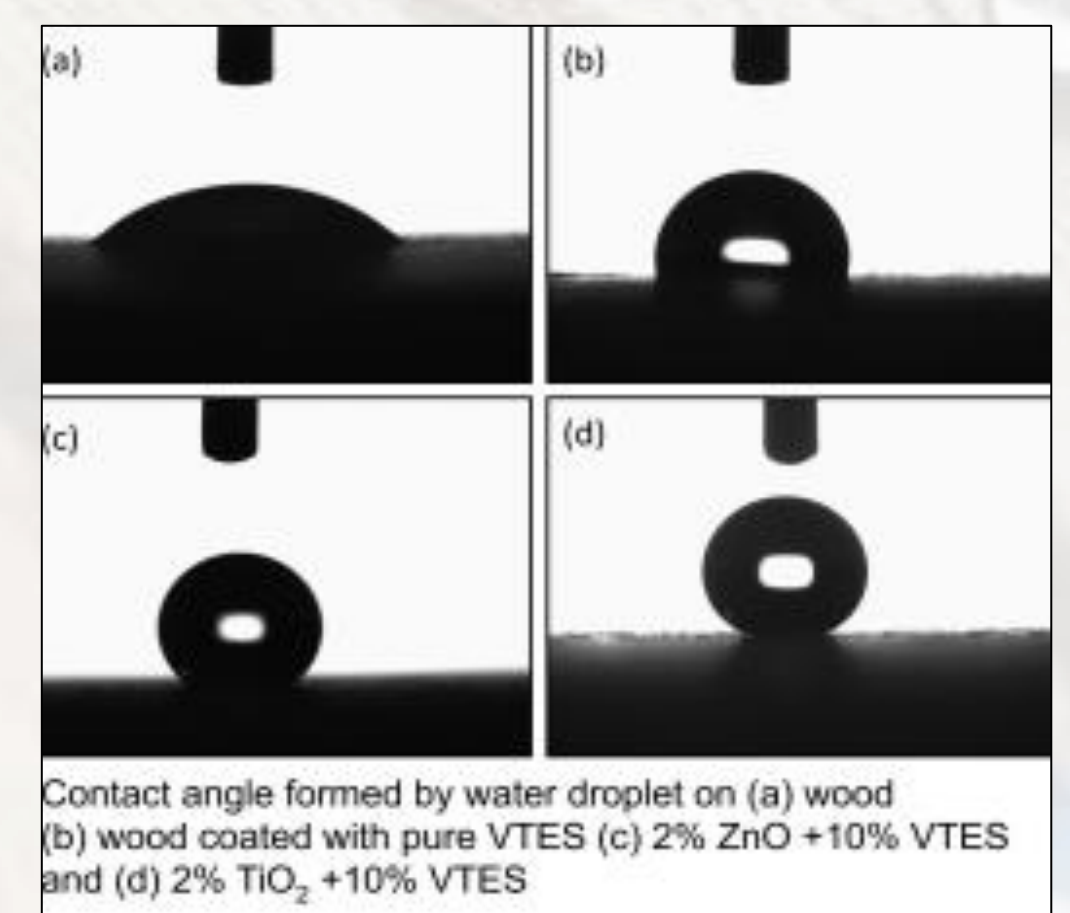
REFERENCES

- S.M. Shah, U. Zulfiqar, S.Zajif Hussain, I. Ahmad, Habib-ur-Rehman, I. Hussain, T. Subhani, A durable superhydrophobic coating for the protection of wood materials, *Materials Letters* (2017).
- Guo, H., Fuchs, P., Casdorff, K., Michen, B., Chanana, M., Hagendorfer, H., ... & Burgert, I. (2017). Bio-inspired superhydrophobic and omniphobic wood surfaces. *Advanced Materials Interfaces*, 4(1), 1600289.
- Sukamanchi, R., Mathew, D., & Kumar K.S., S. (2017). Durable superhydrophobic particles mimicking leafhopper surface: superoleophilicity and very low surface energy. *ACS Sustainable Chemistry & Engineering*, 5(1), 252-260.

RESULTS & DISCUSSION



Code	Treatments	Contact angle (degree)
a	Control	42.4
b	Pure silane	97.6
c	2% ZnO +10% VTES	145.1
d	2% TiO ₂ +10% VTES	153.8



CONCLUSION

A superhydrophobic and UV-resistant coating solution was formulated successfully. The wood coated with the above solution exhibited a contact angle of about 153° and also showed resistance to UV light for an exposure duration of 500 hours. Further studies can be done regarding the long-term stability of the solution and also regarding the moisture uptake and fungal resistance.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to The Director and Group Coordinated Research, Institute of Wood Science and Technology, Bangalore, India for giving us opportunity to conduct the above study and utilize the laboratory facilities

CONTACT INFORMATION

Dishari Chatterjee
Institute of Wood Science and Technology