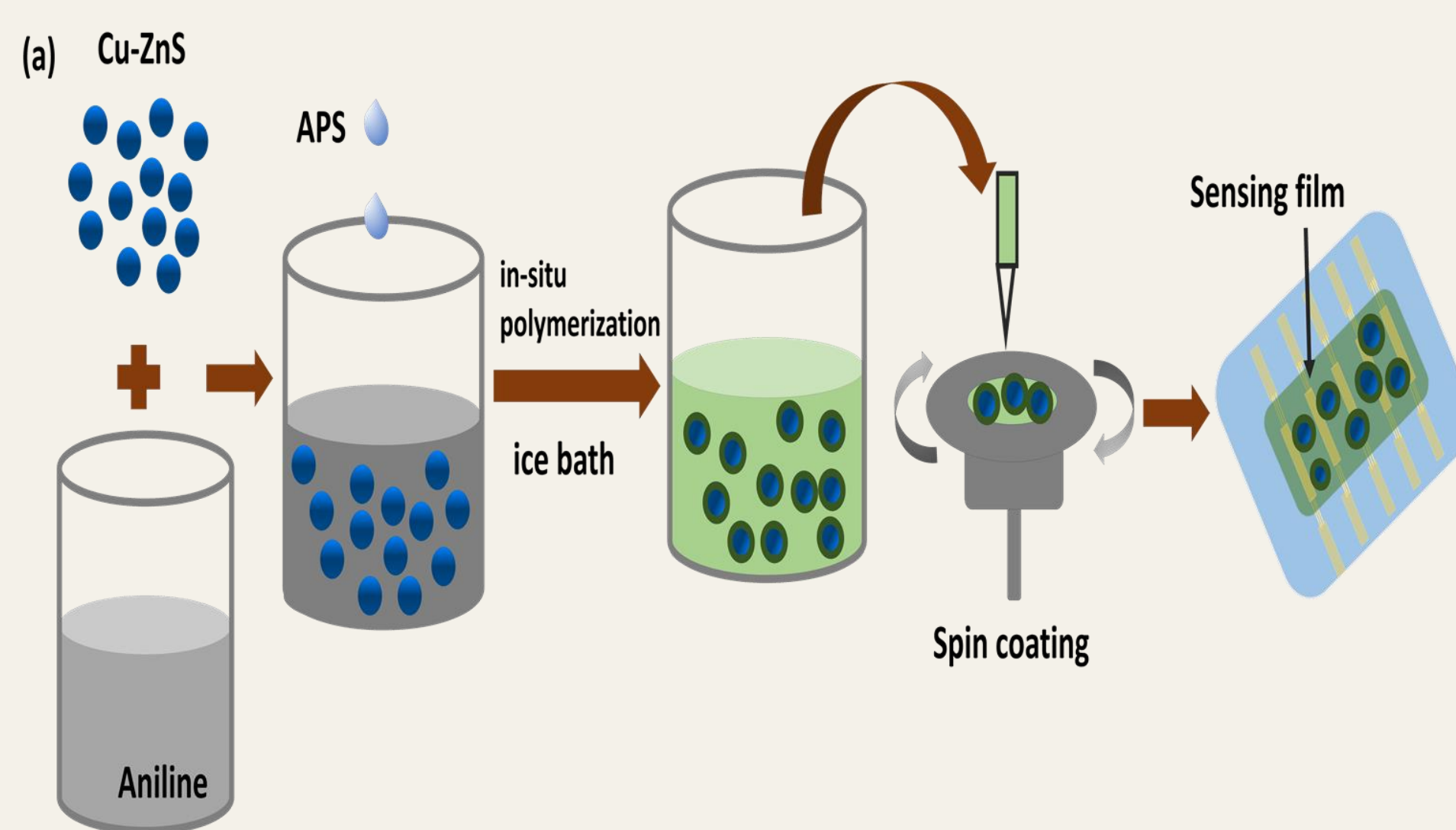


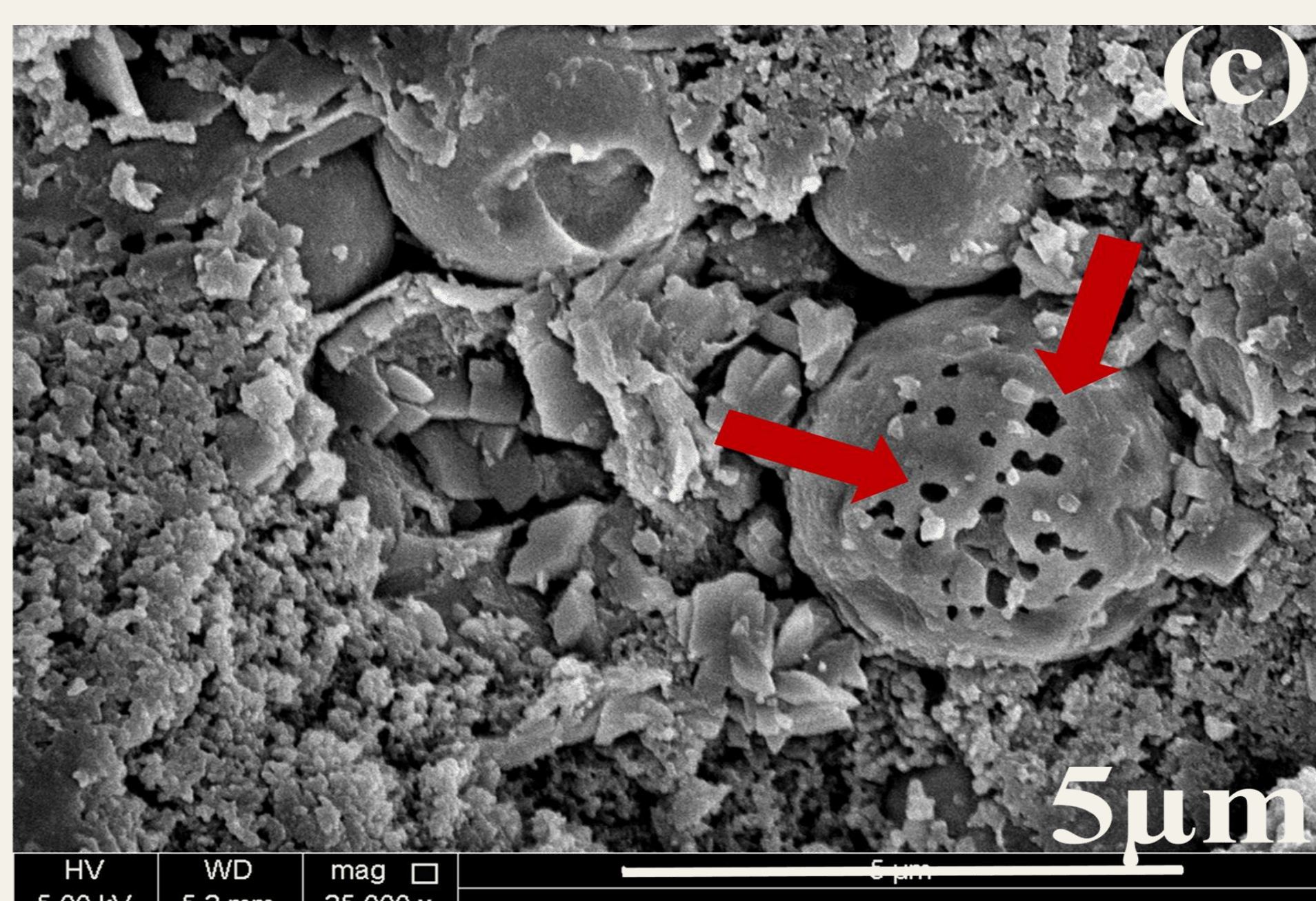
Introduction

- Humidity sensors are widely used in environmental monitoring, particularly in the human comfort zones, as well as in environment monitoring of industrial manufacturing processes.
- The most widely studied materials for humidity sensors are based on metal oxides due to their several unique properties including durability, mechanical and thermal stability.
- The humidity sensor fabricated from PANI/1% Cu-ZnS composite films have shown high sensitivity, quick response and recovery times.

Fabrication of PANI/Cu-ZnS thin film

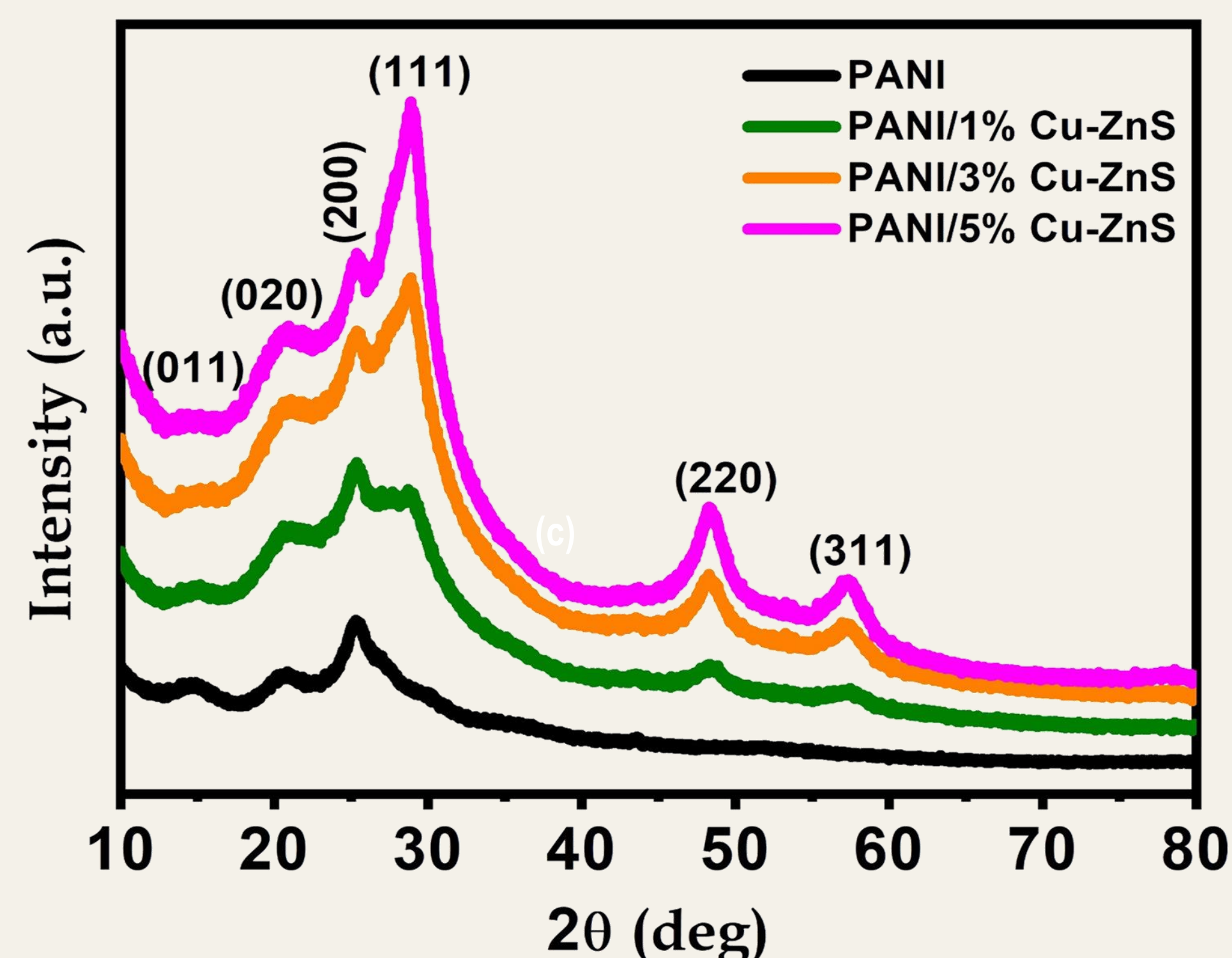


Surface morphology



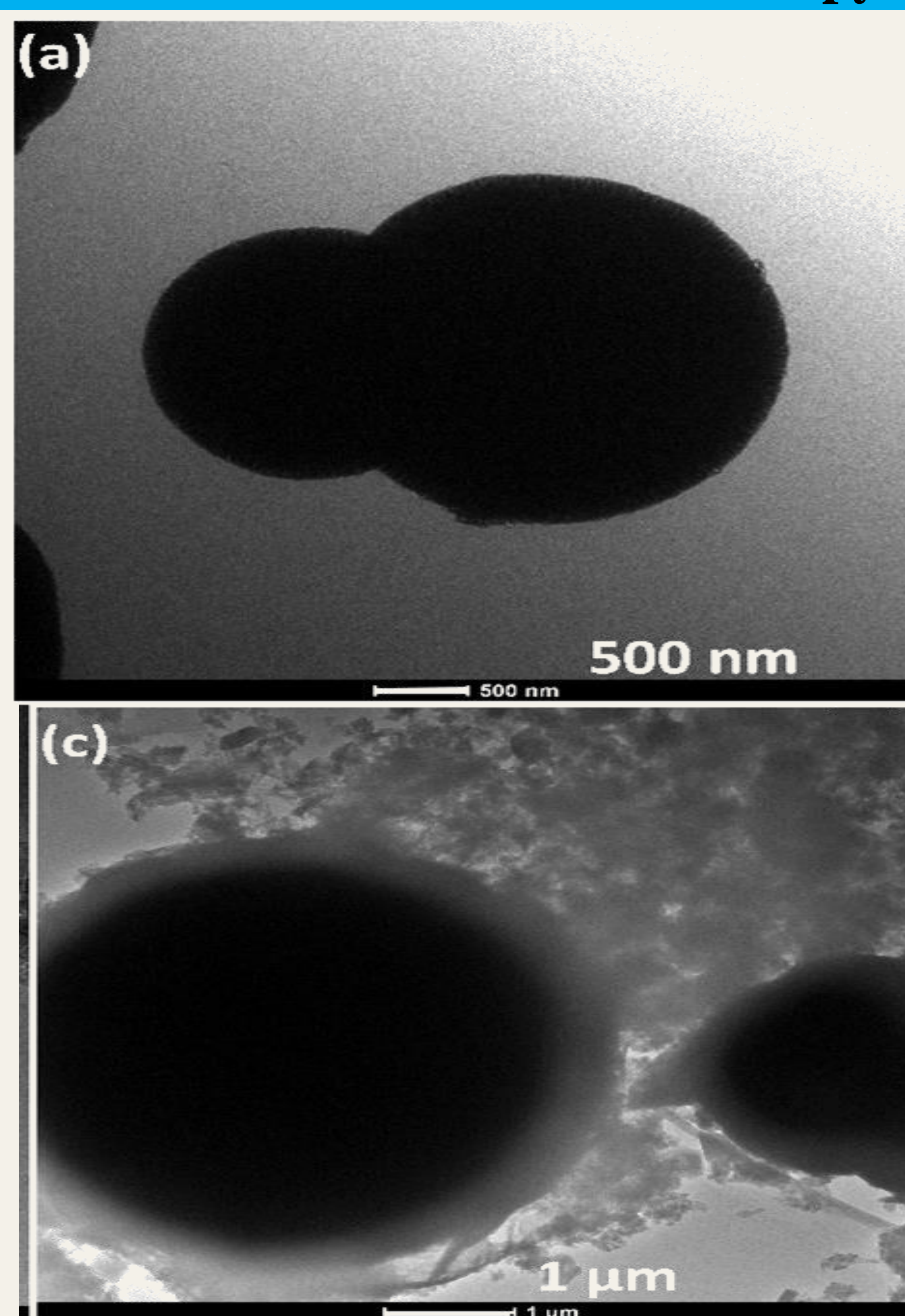
SEM images of (a) Cu-ZnS, (b) PANI/Cu-ZnS.

Structural properties



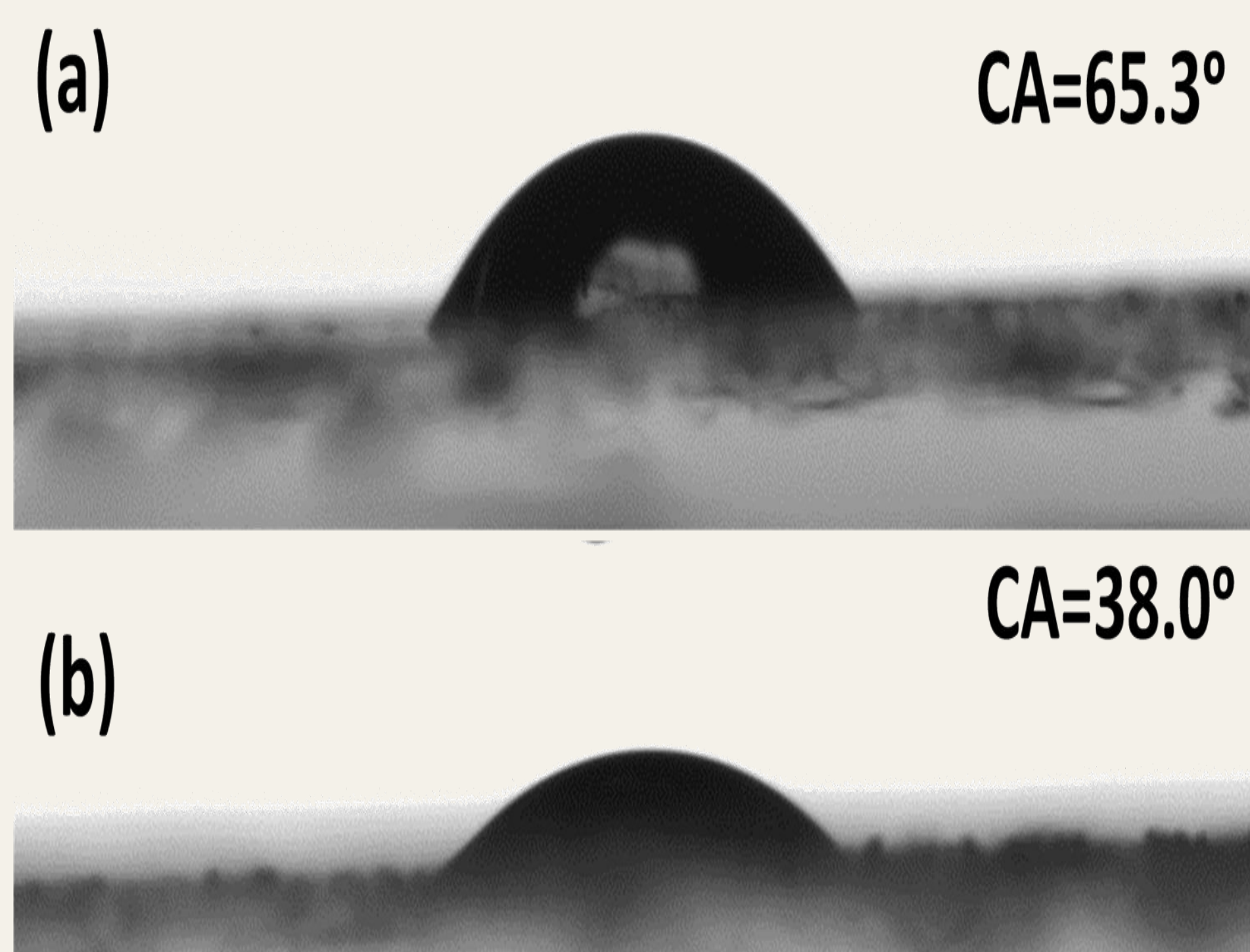
XRD pattern of pure PANI and its composites.

Transmission Electron microscopy



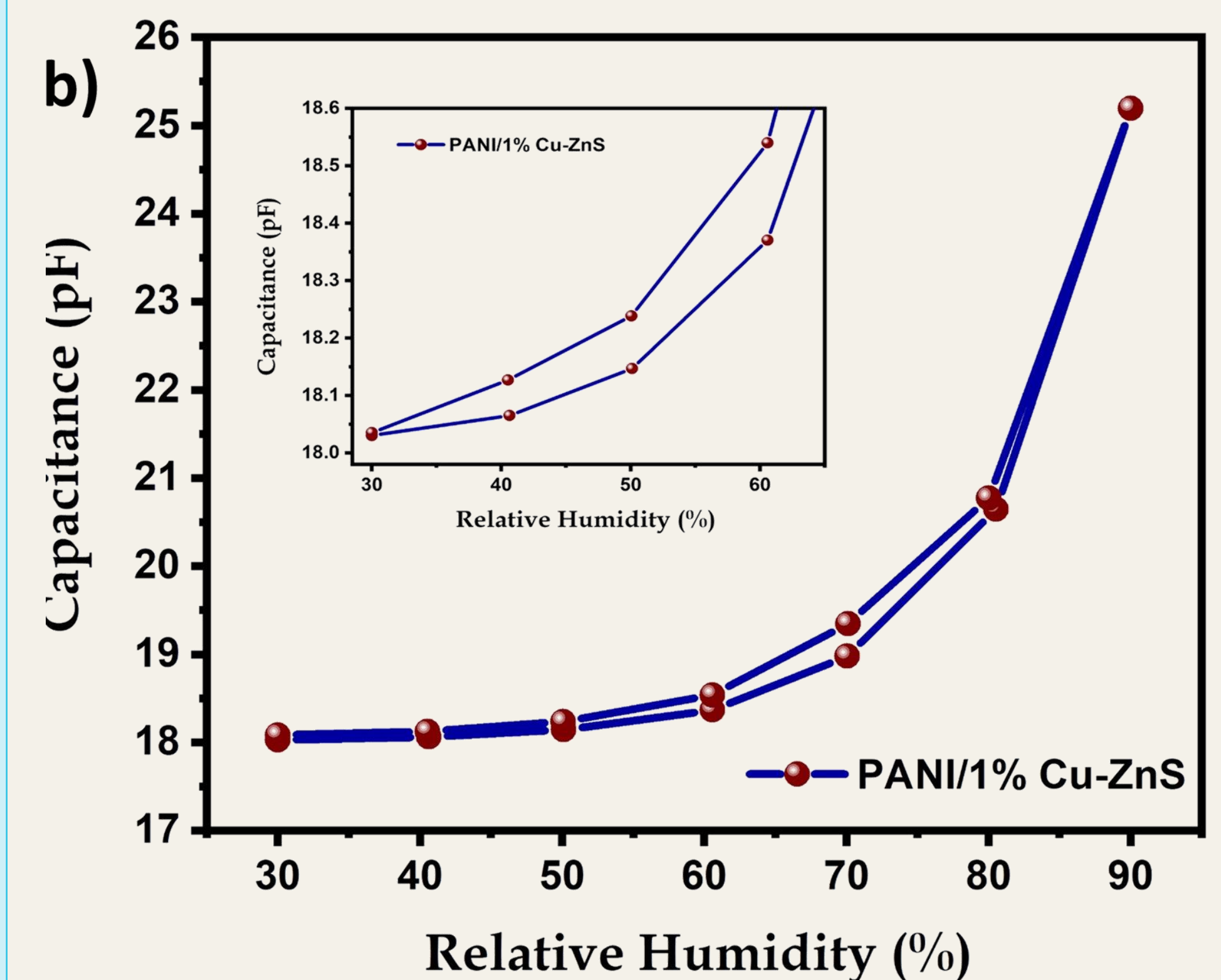
TEM images of (a) Cu-ZnS, (b) PANI/Cu-ZnS.

Surface Wettability

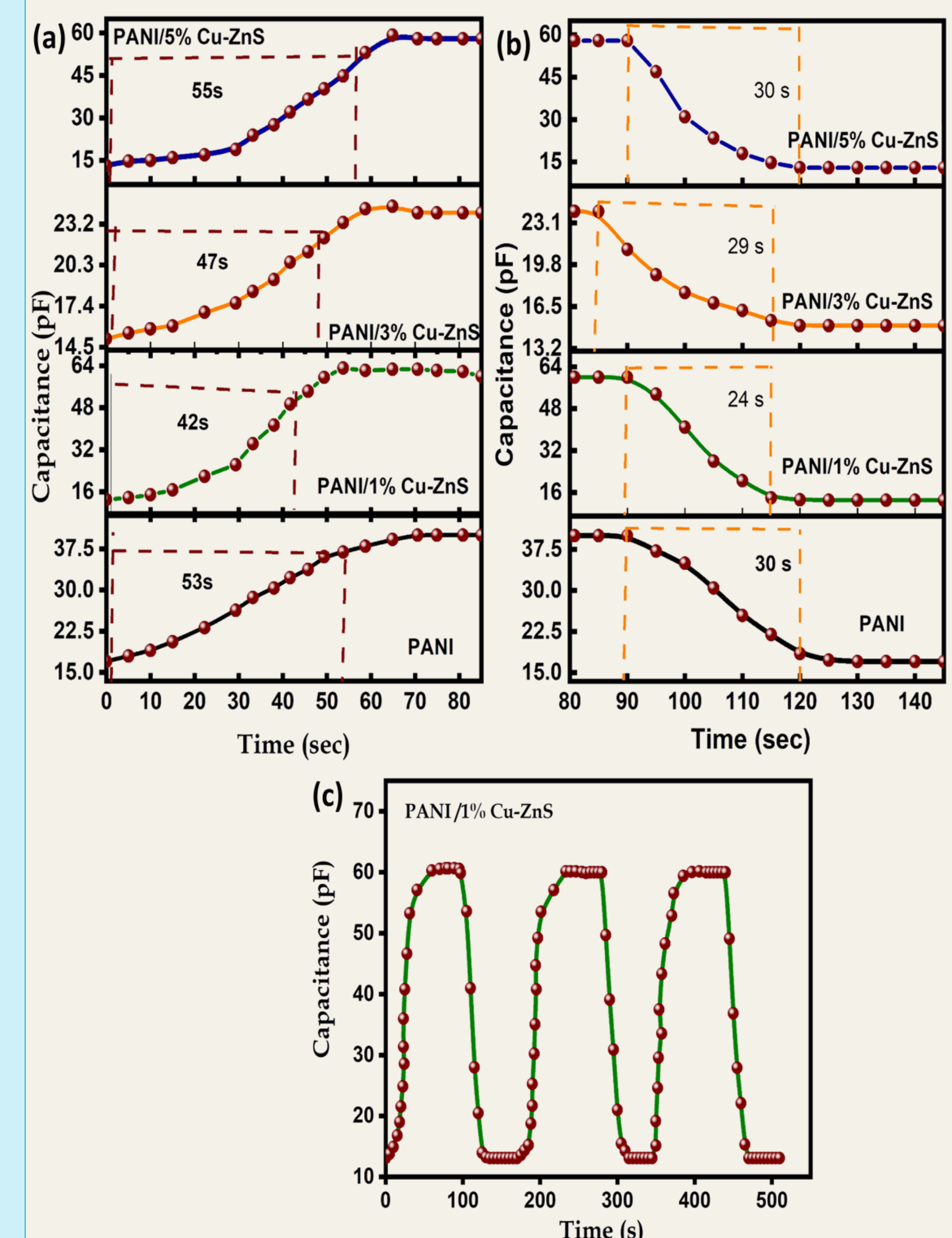


Water contact angle of (a) Cu-ZnS, (b) PANI,

Humidity sensing properties



Hysteresis of PANI/Cu-ZnS composites.



(a,b) Response and Recovery times of PANI and its composites, (C) Repeatability of PANI/Cu-ZnS composite.

Conclusion

- ❖ In this work, PANI/Cu-ZnS composite based humidity sensor are prepared through in situ-polymerization and hydrothermal method.
- ❖ Among, all the composites, the PANI/1% Cu-ZnS exhibited the best response and recovery behavior, which exhibits very low hysteresis of ~1.2%RH with good stability. Also, response and recovery times of the fabricated PANI/Cu-ZnS structures as low as 42s

Acknowledgement

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