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Magnetically Responsive Silicon Carbide Whiskers for Enhanced Nanocomposite Materials

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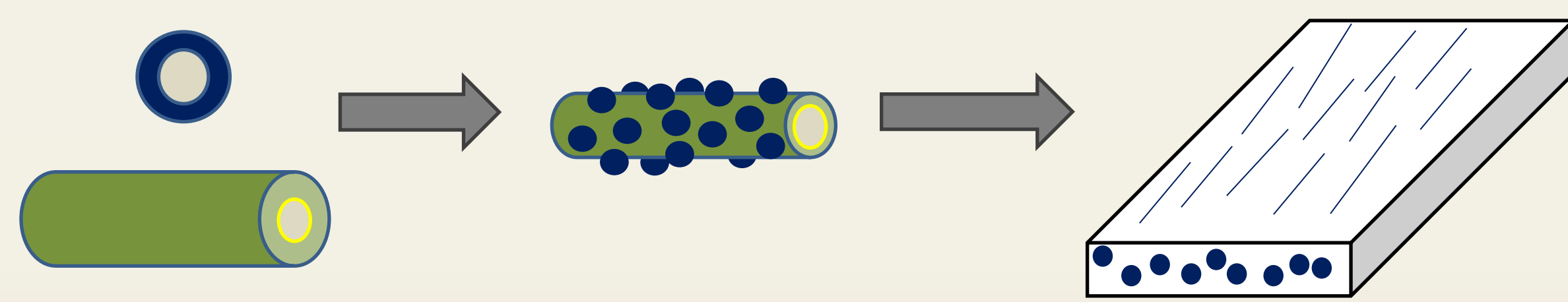
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Statement of Work

Macro scale composite materials have been successful by eliminating delamination and introducing designed directionality. Using this same strategy, we plan to enhance nanocomposites through surface modification.

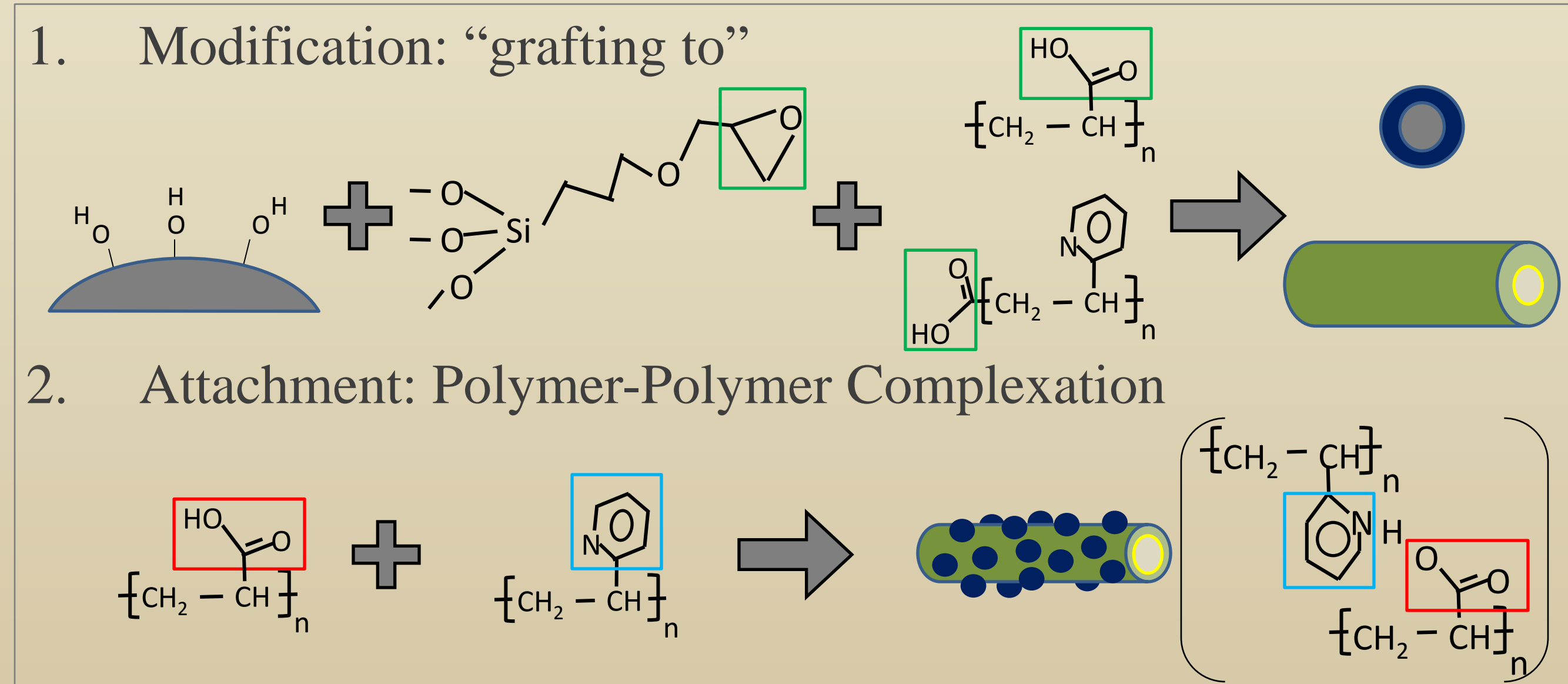
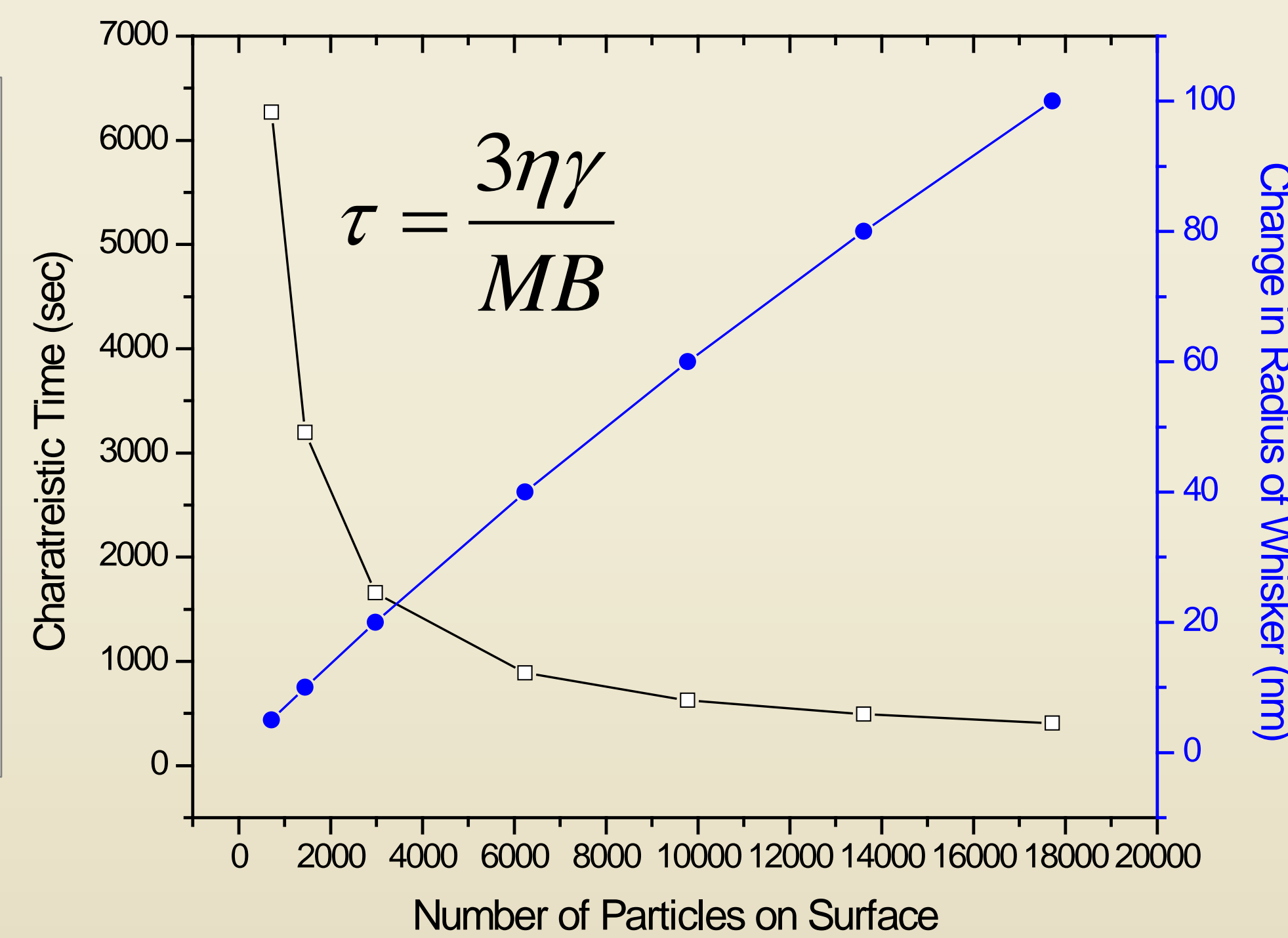
Objectives



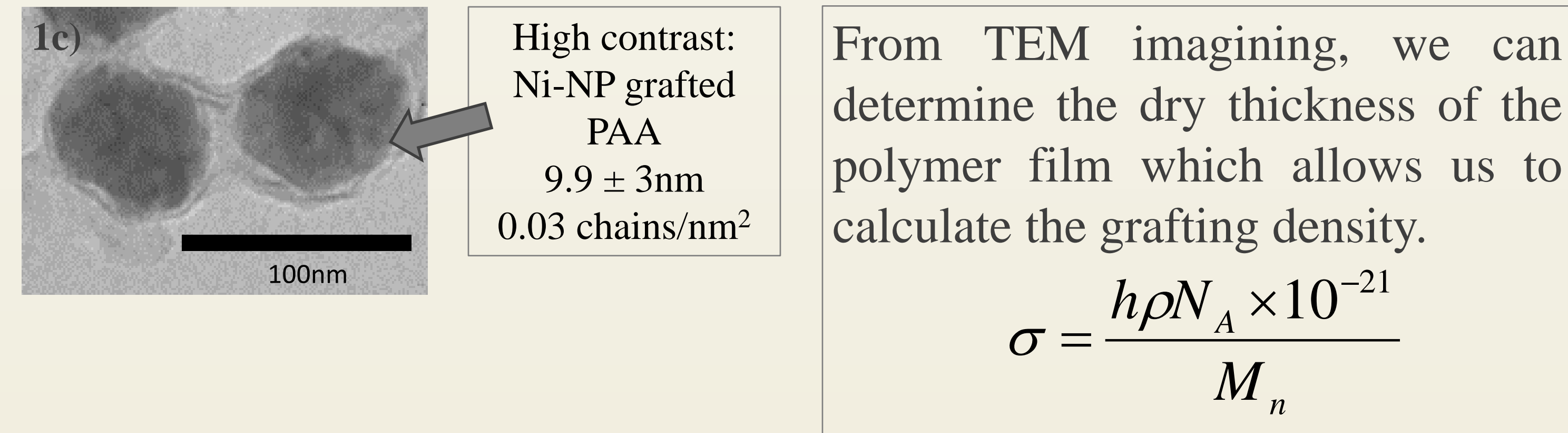
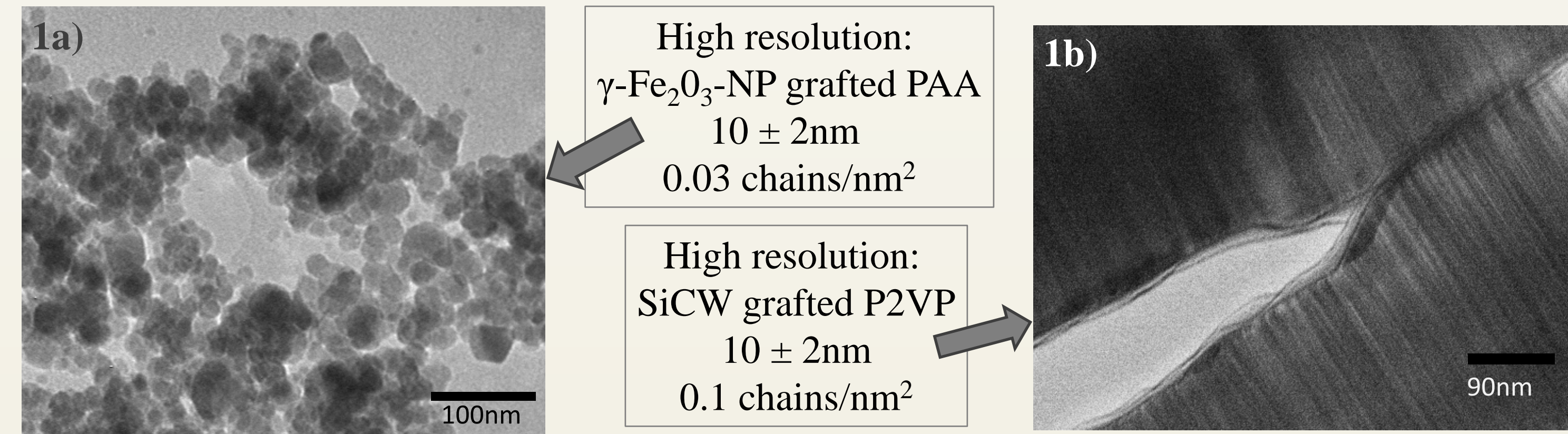
1. Modify Magnetic Nanoparticles (MagNP) and Silicon Carbide Whiskers (SiCW)
2. Attach the Modified MagNP to the Modified SiCW
3. Embed and Orient the Functionalized SiCW in an Epoxy Composite Matrix

Methods

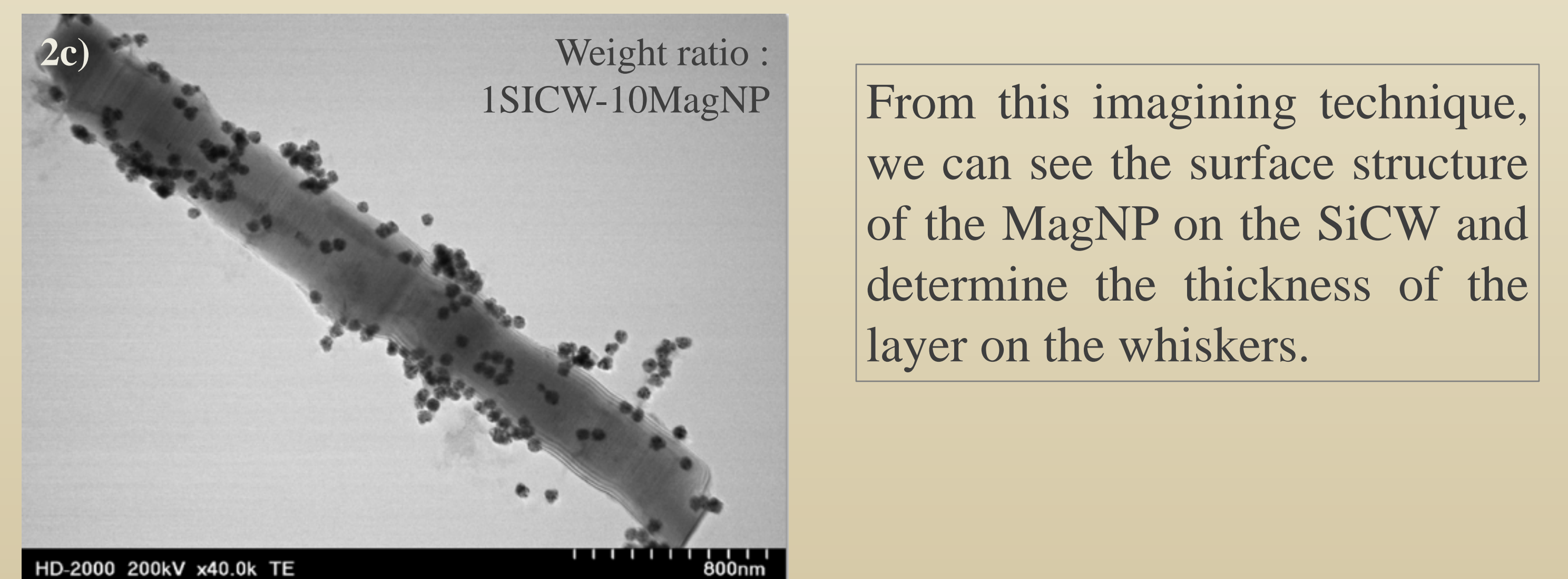
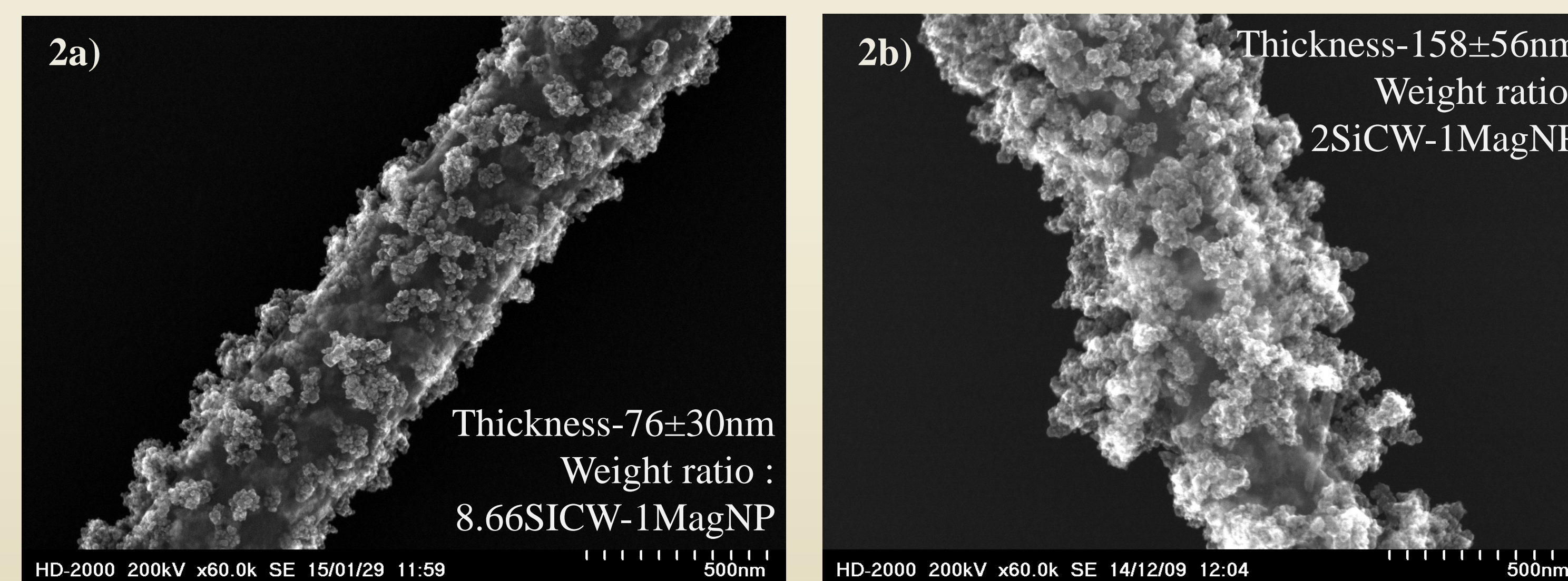
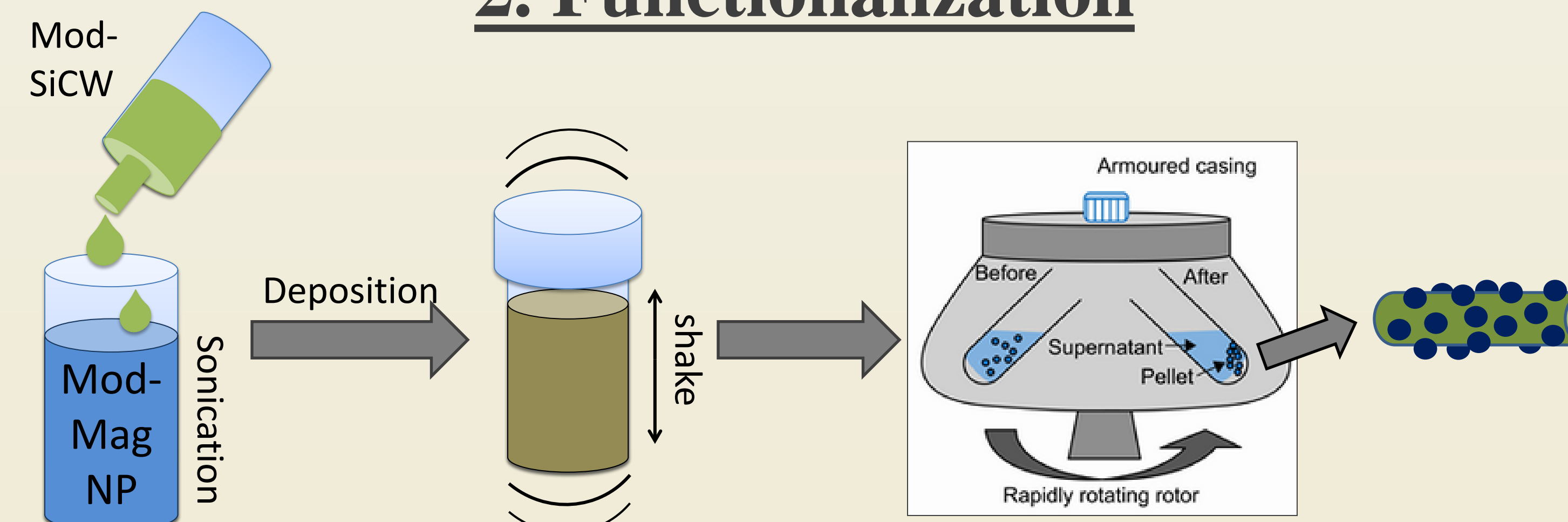
Theoretical calculation for time of rotation for a functionalized SiCW dispersed in an uncured epoxy matrix vs. number of MagNP on surface.



1. Modification

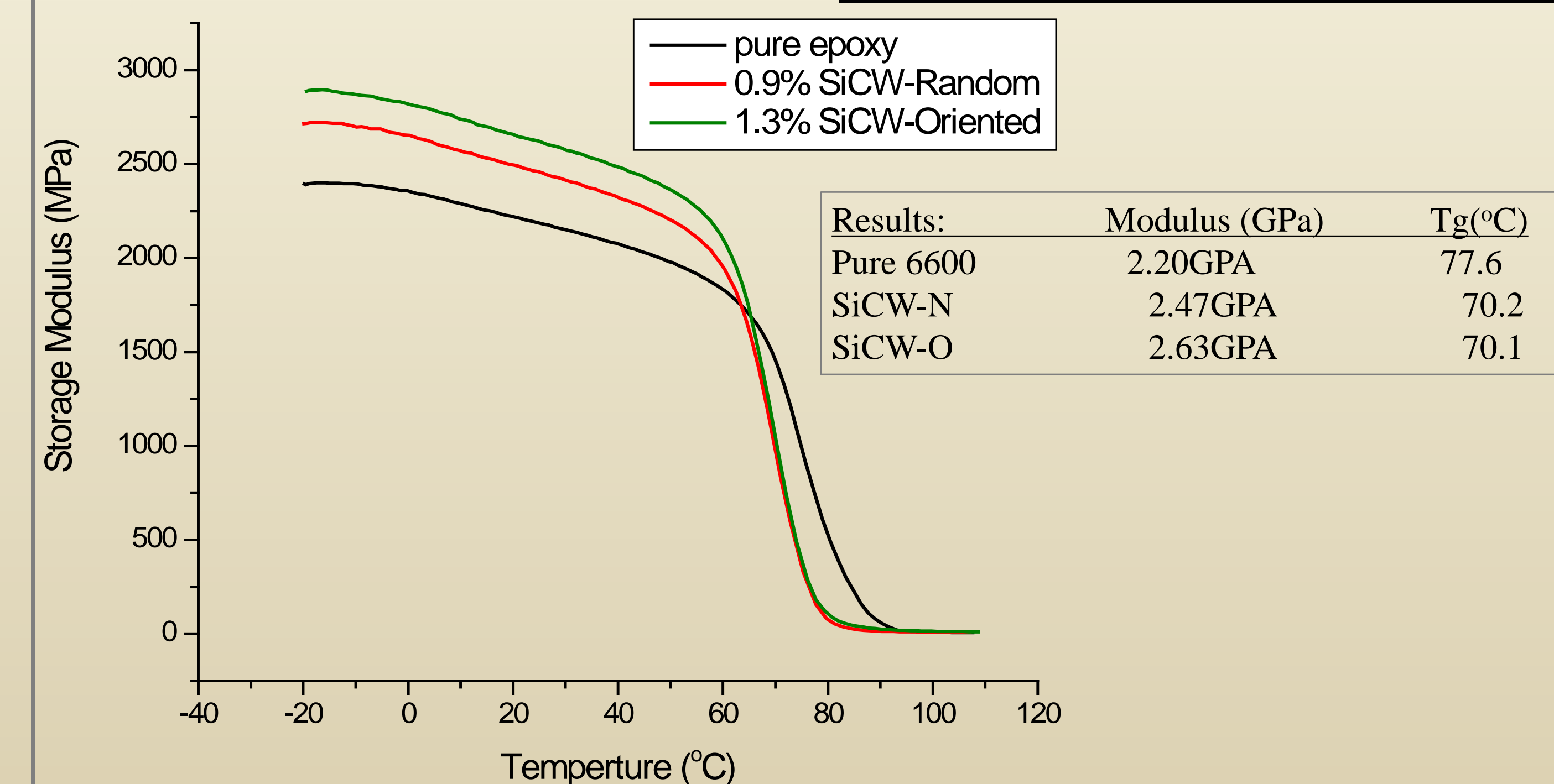
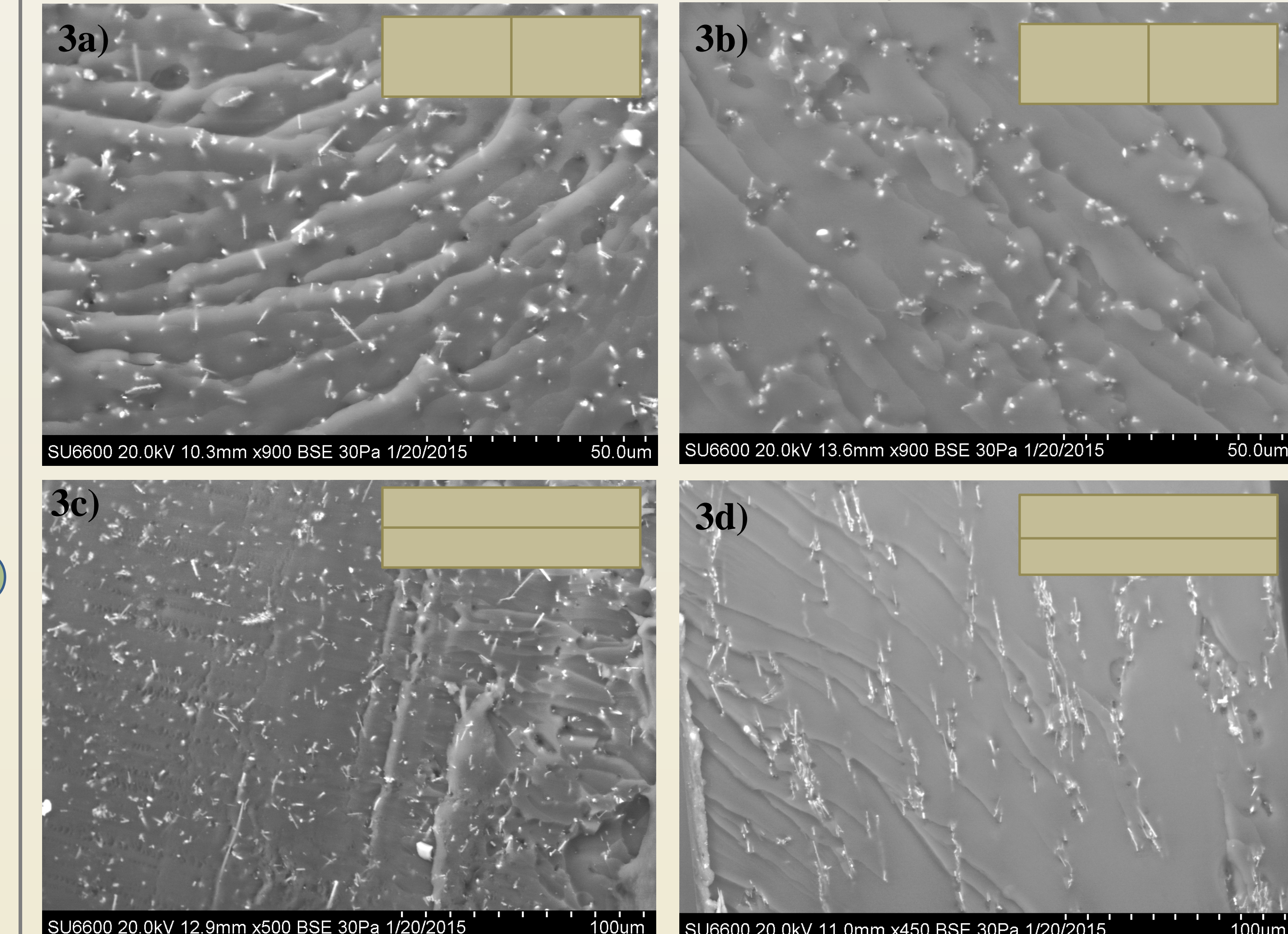
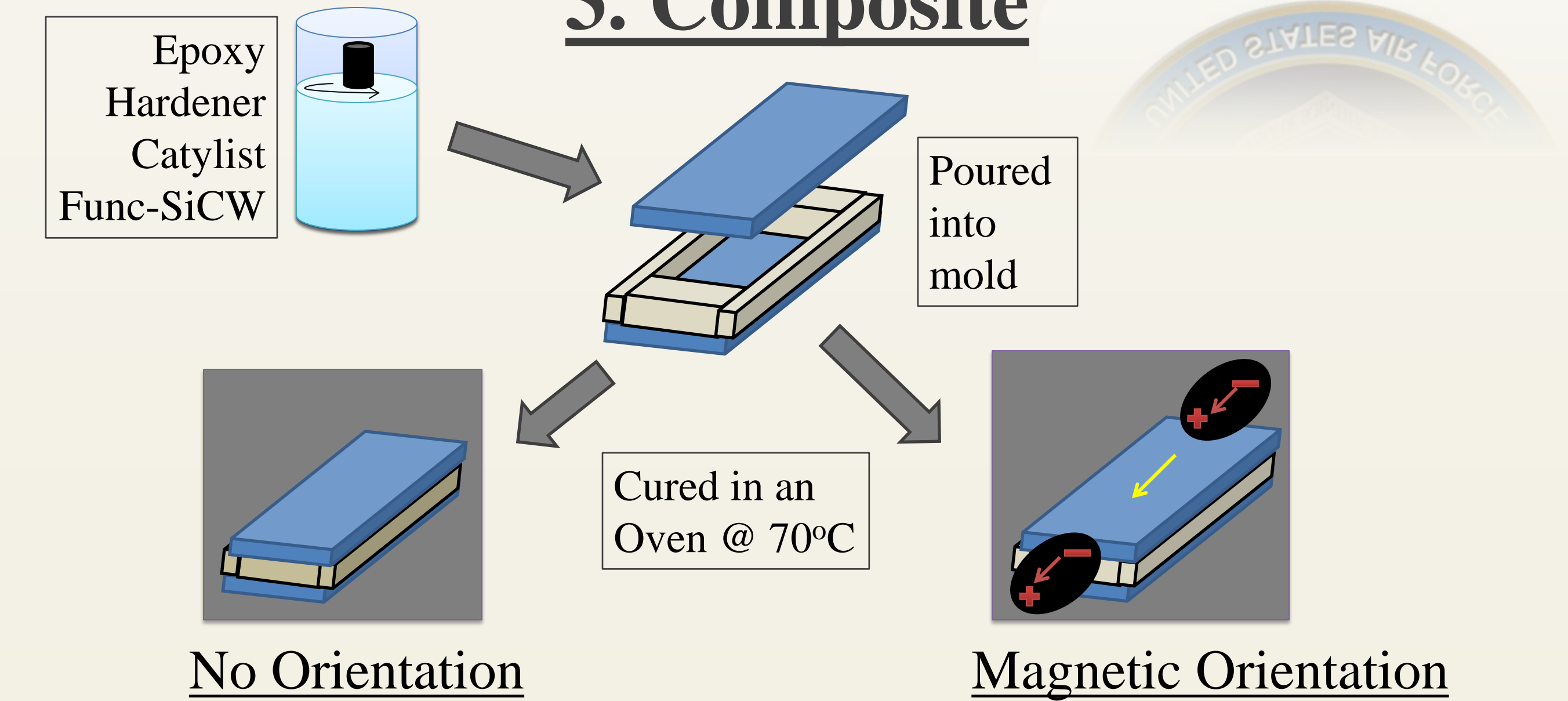


2. Functionalization



From this imaging technique, we can see the surface structure of the MagNP on the SiCW and determine the thickness of the layer on the whiskers.

3. Composite



Conclusion

We can successfully modify, functionalize and embed magnetically active silicon carbide whiskers that will improve the mechanical properties of the nanocomposite system.