# Supporting Information

# Supramolecular hydration structure of graphene-based hydrogels: density functional theory, green chemistry and interface application

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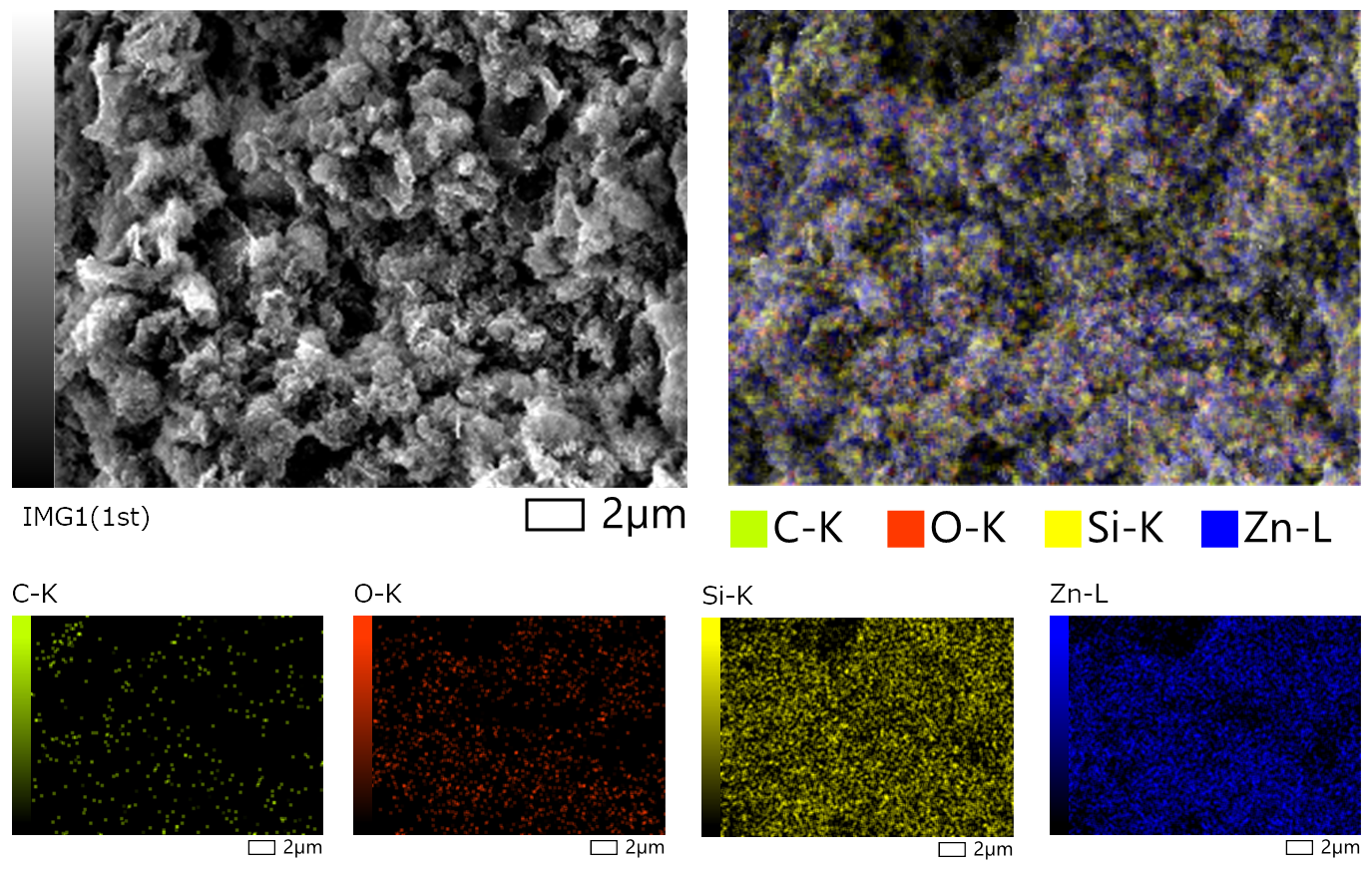
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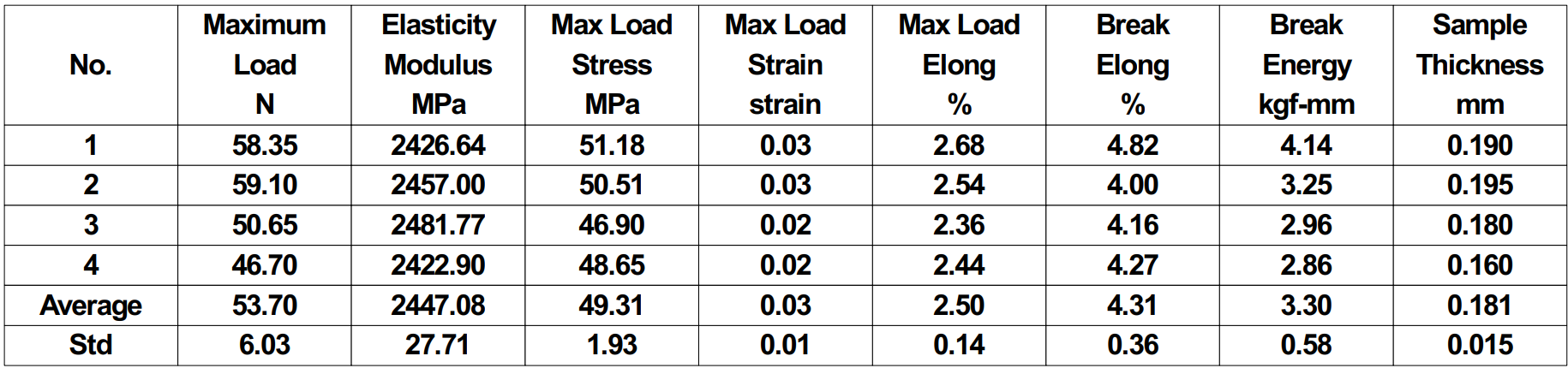


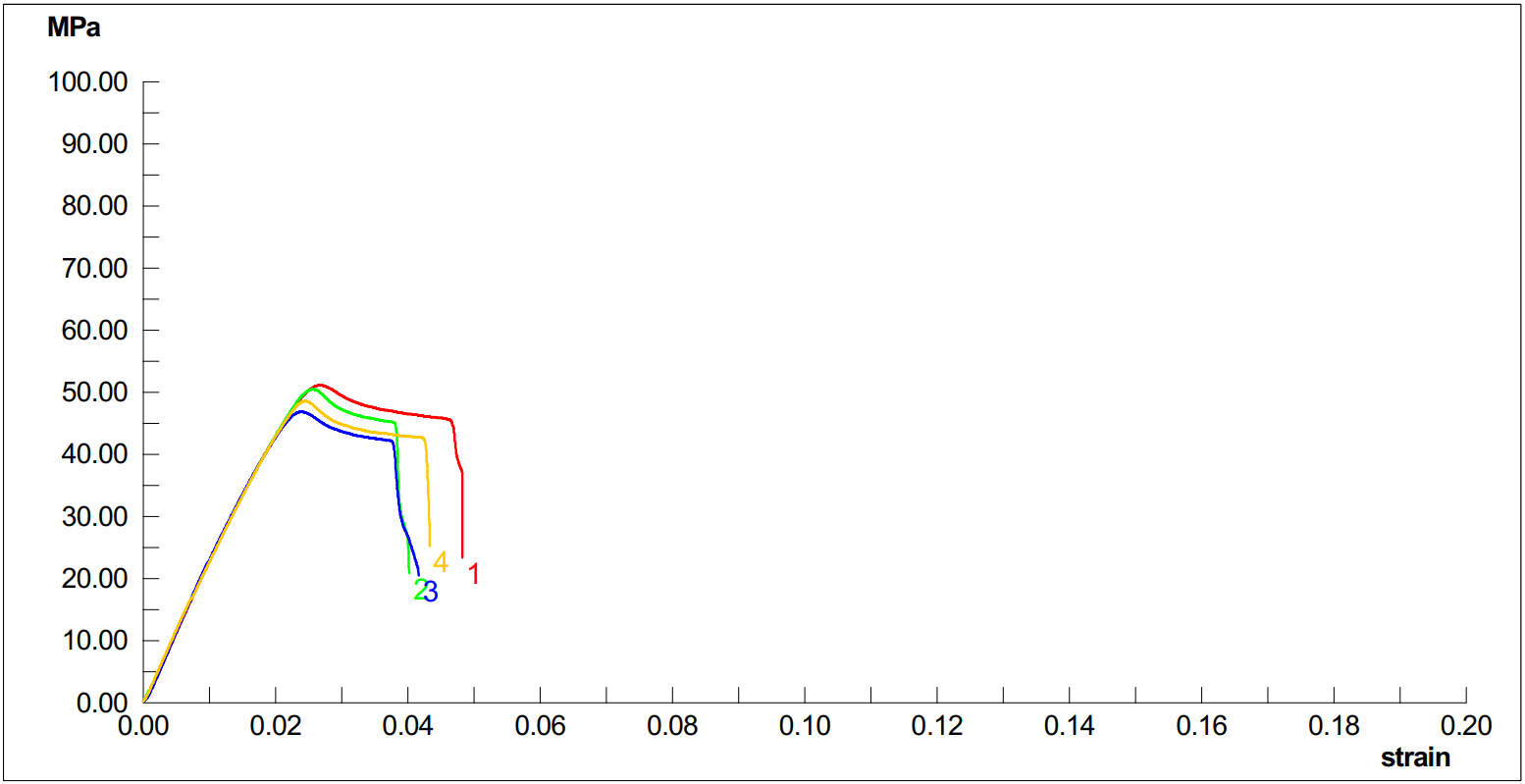
**Figure S1:** SEM-EDS elemental mapping of carbon atoms (green dots), oxygen atoms (red dots), silicon atoms (yellow dots) and zinc atoms (blue atoms) on the graphene-based nanostructures of GO-SG-ZH hydrogel after dehydration.



**Figure S2:** Aqueous dispersions of GO-SG-ZH powder in water at the concentrations of 200 ppm (a) and 50 ppm (b). Aqueous dispersions of GO-SG-ZH hydrogel in water at the concentrations of 200 ppm (c) and 50 ppm (d).

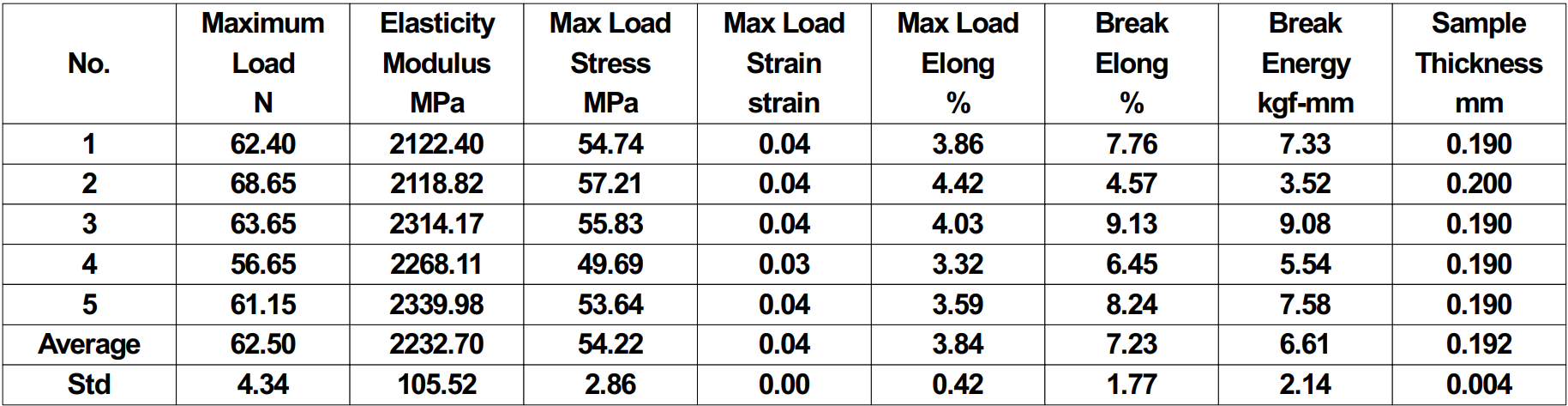
**Table S1:** Value results of tensile measurement of SG/PLA films.

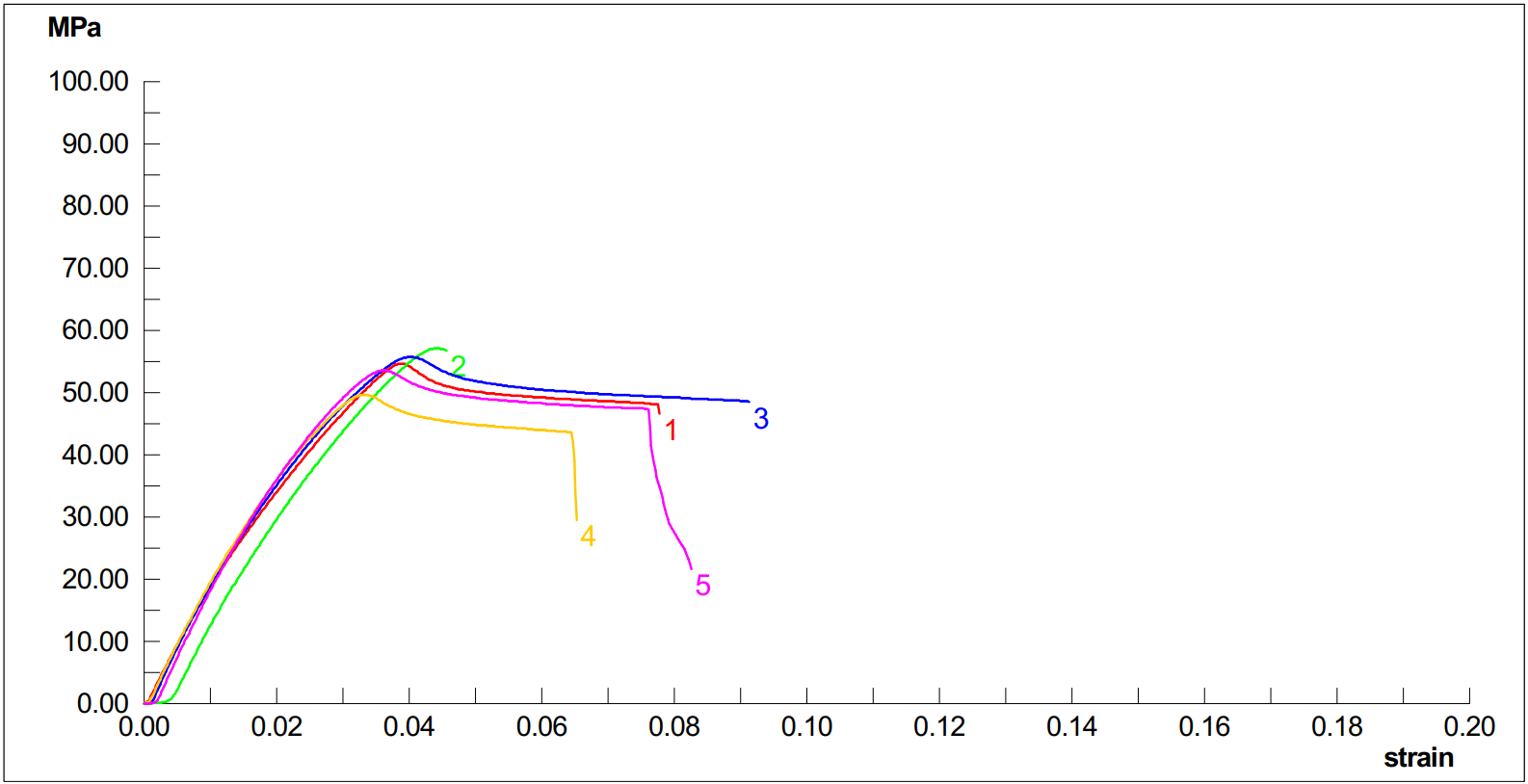




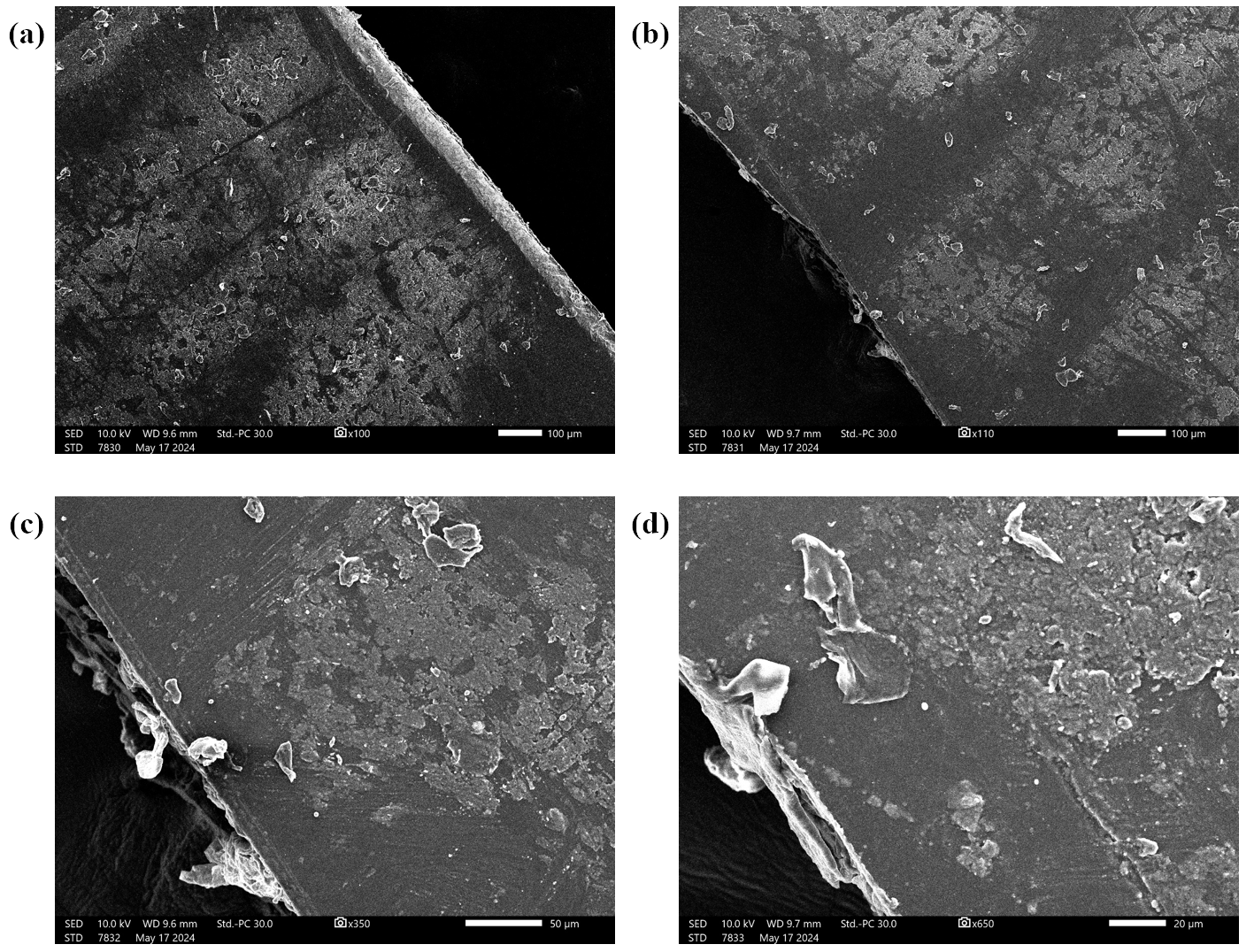
**Figure S3:** Stress – strain curves of tensile testing of SG/PLA films.

**Table S2:** Value results of tensile measurement of GO-SG-ZH/PLA films.





**Figure S4:** Stress – strain curves of tensile testing of GO-SG-ZH/PLA films.



**Figure S5:** SEM images of surfaces and fractures of GO-SG-ZH/PLA films after tensile testing. The fractures were generated by the tensile measurement.