SHIRAKASHI LAB.

Seeking water molecules hidden in hydrated materials

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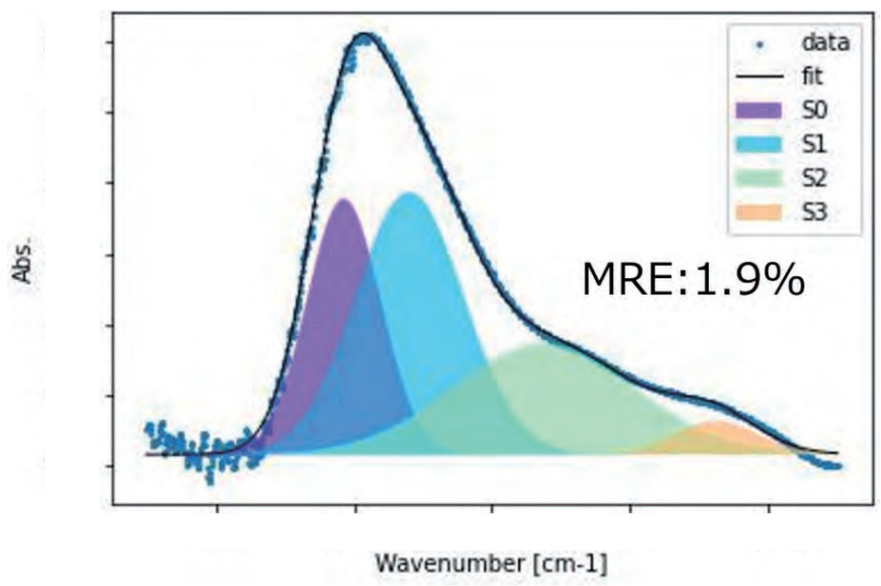
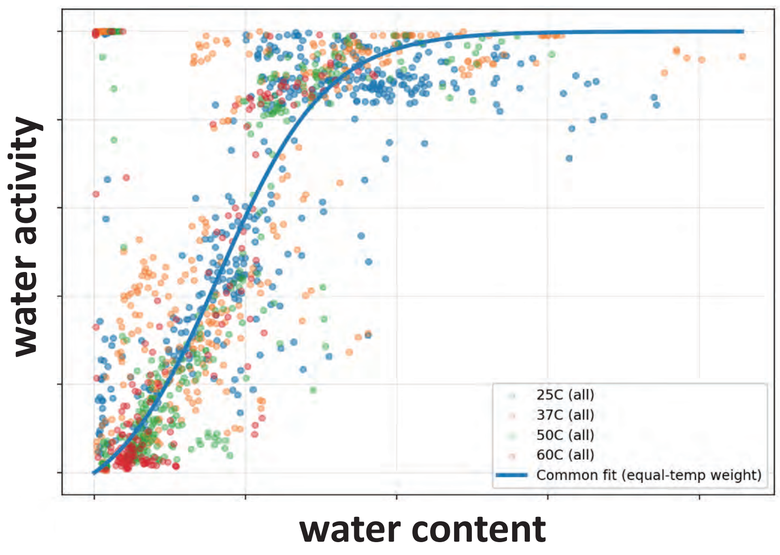
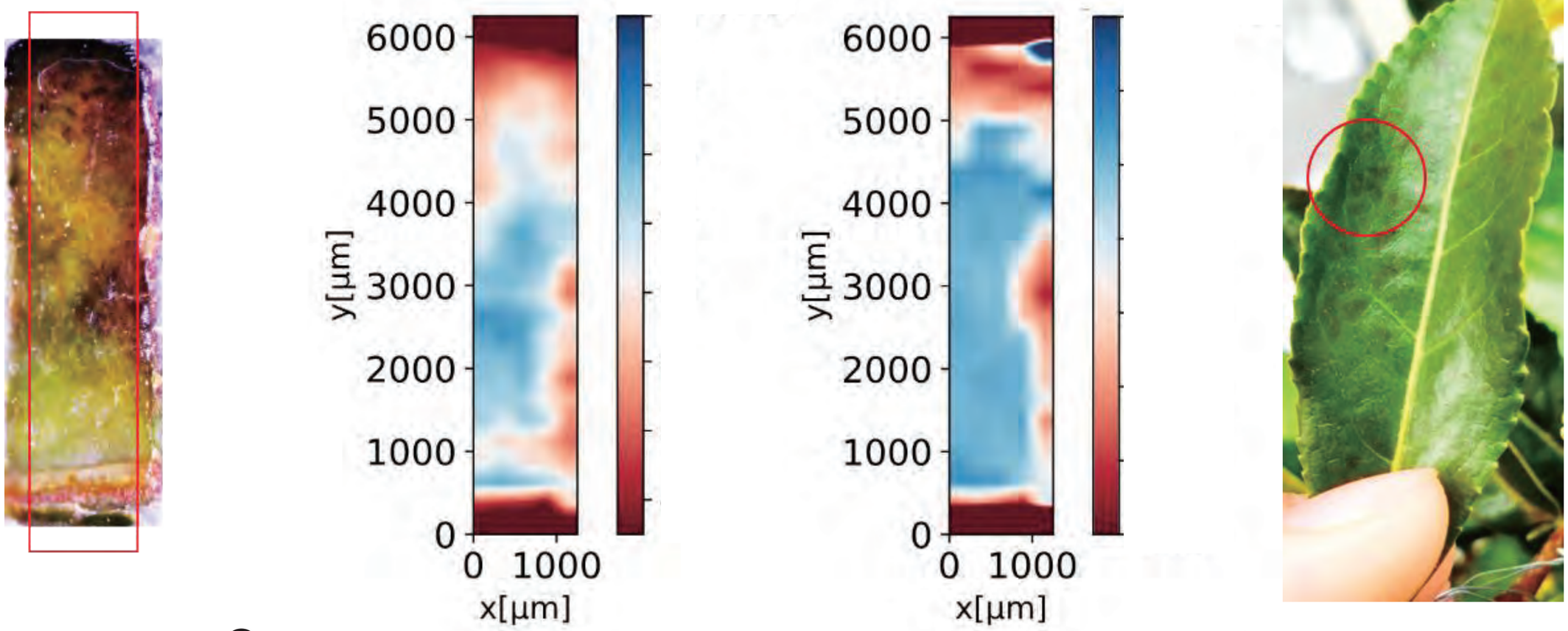
Water molecules in hydrated materials behave differently from pure water in terms of diffusion, evaporation, and freezing. Since these behaviors significantly impact material properties, it is crucial to understand the local state of water hidden within the materials of complex structures with multiple components. Our laboratory develops methods to measure the diffusion coefficient and water activity in hydrated materials —the key factors determining these water characteristics—using dielectric and short-wave infrared (SWIR) spectroscopies.



◎ Short Wave InfraRed spectrum of green tea leaf



◎ Water activity of steamed green tea leaves



◎ Distributions of hydrogen bonding energy and molarity of water in a partially red-withered green tea leaf