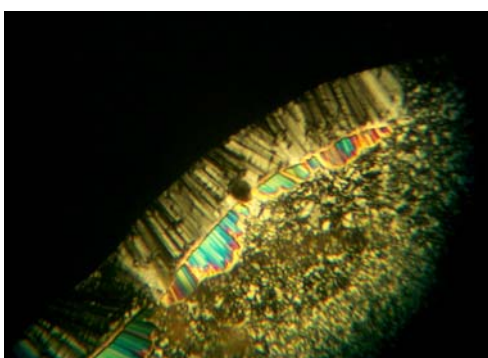
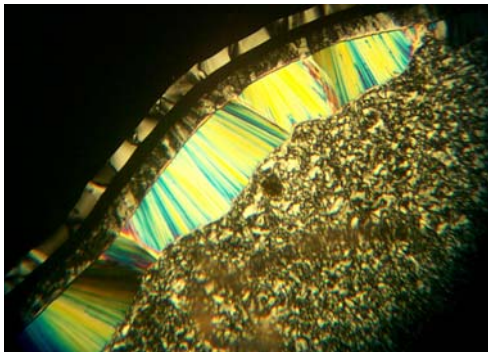
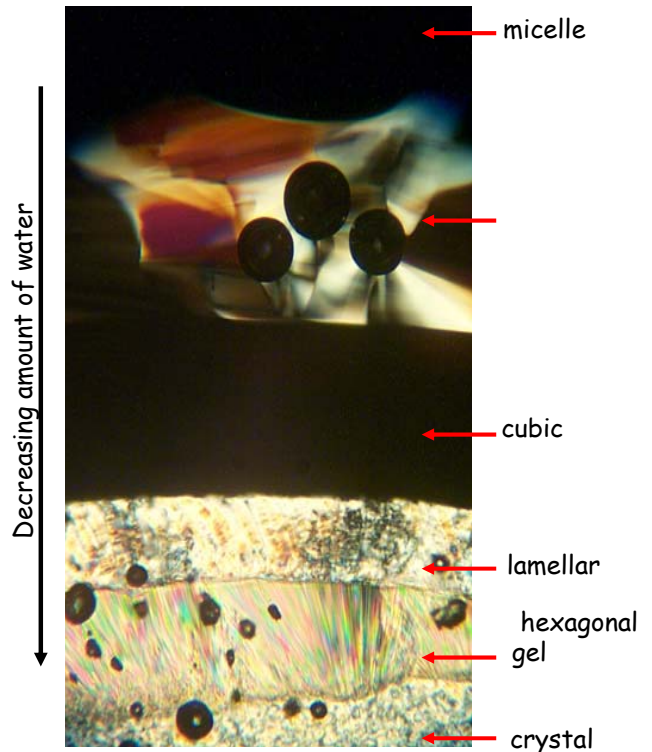


# Inducing Metallomesogenic Phases in Water-*n*-Octyl- $\beta$ -D-glucopyranoside Mixtures

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**Background.** Previous work has shown us that under the correct conditions water and *n*-Octyl- $\beta$ -D-glucopyranoside form lyotropic liquid crystal phases. We expect a third component to adopt the order of a lyotropic liquid crystal through *guest-host interactions*. We wanted this third component to contain a transition metal ion so any ensuing liquid crystal would be a metallomesogen, a mesogenic sub-category which has been left largely unstudied.

**Approach.** We used Polarizing Light Microscopy (PLM) to examine penetration studies of *n*-Octyl- $\beta$ -D-glucopyranoside by various solutions of metal acetates.



Top: Penetration Study, *n*-Octyl- $\beta$ -D-glucopyranoside and 10.6 mM Magnesium acetate tetrahydrate, 25°C

Bottom: Penetration Study, *n*-Octyl- $\beta$ -D-glucopyranoside and 10.6 mM Magnesium acetate tetrahydrate, 40°C

**Results.** We determined that our method of sample preparation did not allow enough metal cation to be integrated into the "host" structure, so no metallomesogenic phase was observed. However, we did verify the previous work completed on the water - *n*-Octyl- $\beta$ -D-glucopyranoside lyotropic liquid crystal system visually using the PLM. We also noted that the presence of the third component lowered the transition temperatures in some of the phases.

**Future Work.** We would like to find a way to make samples containing high concentrations of metal acetate. We would also like to observe and document specific composition samples under a temperature ramp. Finally, a long term goal of this project is to characterize the phases that result from *guest-host interactions* using other techniques.

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