

Machine Learning-Assisted Workflow to Characterize Phase Separations

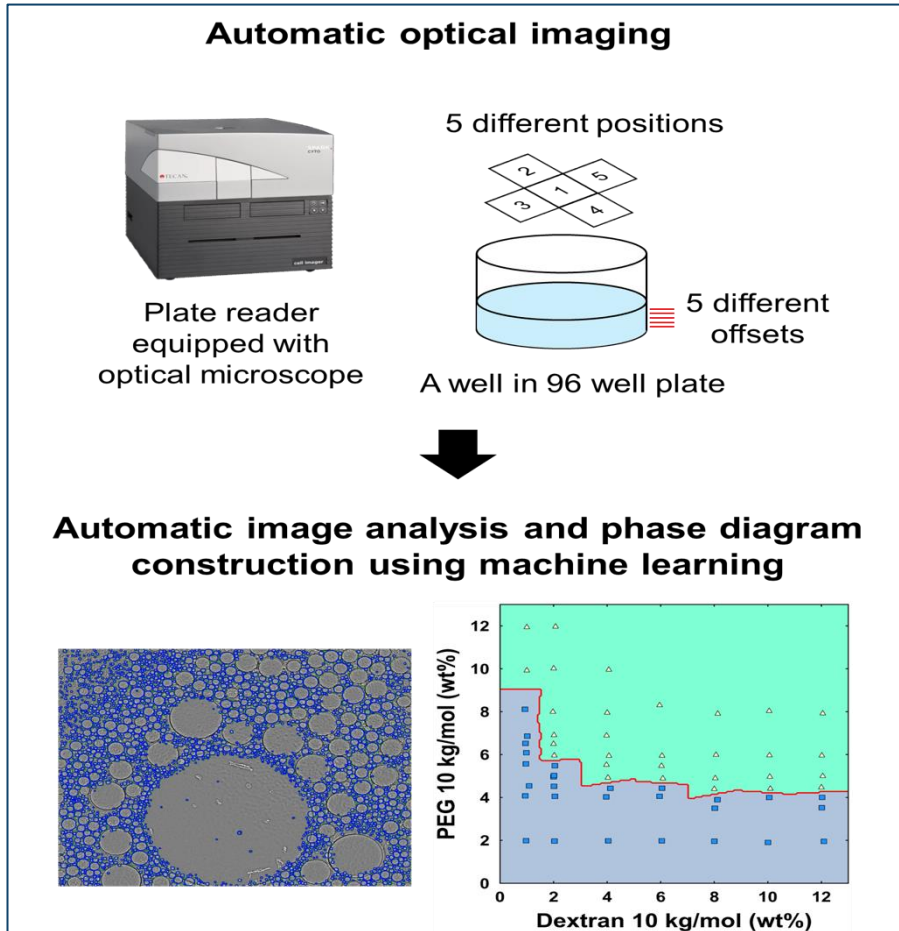


Figure: Automated optical imaging and analysis workflow for constructing ATPS phase diagrams.

Scientific Achievement

A CINT User Team developed a new automated workflow for constructing phase diagrams of liquid-liquid mixtures by combining optical imaging and machine learning.

Significance and Impact

Current characterizations include slow and error-prone manual inspections. This new workflow offers an efficient and versatile platform for automated phase diagram construction.

Research Details

- Machine learning:
 - Analyzed and classified thousands of images.
 - Accurately determined phase boundaries in systems that are difficult to measure.

Thomas, N.; Witmer, A.; Lee, H. K.; López, C. A.; Reddy, T.; Kim, M. Machine Learning-Assisted Phase Diagram Determination in Aqueous Two-Phase Systems. *Langmuir*. 2026.

Work was performed, in part, at the Center for Integrated Nanotechnologies.