In-situ Liquid Phase Electron Microscopy for understanding dynamic nanochemistry

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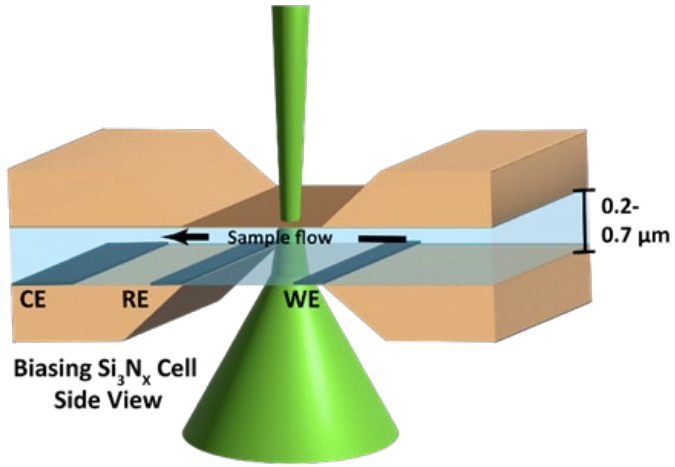
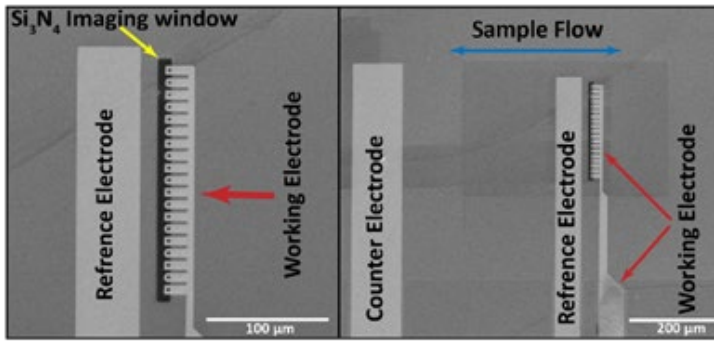
Microscopes have played a major role in the discovery of new phenomena in materials science. These discoveries provide opportunities to design and develop materials with new and improved properties.

Researchers at the University of California Irvine and DENSsolutions are developing Liquid Phase Electron Microscopy holders and nanocells to enable us to visualize nanoscale dynamics processes in solution. The system has a unique on-chip flow channel combined with a microheater or electrodes. The channel enables direct flow over the imaging area and rapid replenishment of the solution inside. Future work will involve combining stimuli, making in-situ measurements of the chemical environment and using the holder to better understand active materials processes.

An exploded diagram Stream holder tip



Schematic of the nanocell.



SEM Images of the electrode on the surface of the nanocell chips

Journal of Materials Chemistry C, 2020, 8, 10781-10790