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Studying dynamic processes in liquids by TEM/STEM/DTEM
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— In order to study dynamic phenomena such as corrosion or catalysis, extreme environmental conditions must be reproduced around the specimen - these include high-temperatures, high-pressures, specific oxidizing/reducing atmospheres or a liquid environment. The use of environmental stages specifically designed to fit in any transmission electron microscope (TEM) allows us to apply the distinct capabilities of each instrument to study dynamic processes. Localized gas/fluid conditions are created around the sample and separated from the high vacuum inside the microscope using hermetically sealed windowed-cells. Advanced capabilities of these techniques include spatial resolutions of $\sim$1 Angstrom or better in aberration corrected instruments or temporal resolutions in the microsecond-nanosecond range in a dynamic TEM (DTEM). Here, unique qualities of the DTEM that benefit the *in-situ* experiments with gas/fluid environmental cells will be discussed. We also present our results with a liquid stage allowing atomic resolution imaging of nanomaterials in a colloidal suspension, core EEL spectra acquisition, continuous flow, controlled growth of nanocrystals and systematic calibration of the effect of the electron dose on silver nuclei formation.

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