Probing the growth and biodegradation of nanomaterials with liquid transmission electron microscopy

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Liquid-cell transmission electron microscopy has been recently implemented on an aberration-corrected microscope at Paris Diderot University. This *in situ* technique consists in imaging the dynamics of nano-objects in an encapsulated liquid solution within an electron-transparent microfabricated cell. Composition of the environment is controlled with a micro-fluidic system which enables to mix different reaction solutions at the observation window. Here, we have exploited this environmental sample holder to reveal the growth mechanisms of gold nanoplates (Alloyeau et al. Nanoletters 2015) and for the first time, to study the biodegradation processes of carbon nanotubes. Through these two studies, we will show that liquid-cell TEM is an important step forward to investigate dynamical processes that arise at the liquid-solid interfaces, opening many avenues in both materials and life sciences.