

Real time observations of liquid phase growth processes

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In situ electron microscopy has been successfully used to image both solid state and vapour phase growth processes, providing real time, quantitative data which has been useful for developing growth models. Liquid phase processes are less studied because of the increased complexity of incorporating liquids into the TEM sample environment, compared to gases or solids. In this presentation we will consider two classes of liquid phase growth experiments which can be studied in situ. The first is the formation of crystalline nanowires from liquid phase catalysts. In this case, observations are straightforward because of the low vapour pressure of the liquid. The second is electrochemical deposition, which is experimentally more complex because the liquid must be hermetically sealed yet still electron transparent. In both cases, however, it is possible to obtain kinetic data that can be matched with growth models. We will discuss the future prospects for in situ microscopy in the study of other liquid phase phenomena.