

**Surface studies of atomic layers formed in the
electrodeposition of compound semiconductors using
EC-ALE.**

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Electrochemical atomic layer epitaxy (EC-ALE) is the electrochemical analog of atomic layer epitaxy (ALE), a method used to form compounds an atomic layer at a time, using surface limited reactions. In EC-ALE, upd is used to form the atomic layers.

A number of groups are working on the development of EC-ALE, and a range of compounds have been formed, including the II-VI compounds based chalcogenides and Zn or Cd. In addition, progress has been made on III-V compounds such as InAs, InSb, and GaSb. Recently, PbTe and PbSe have been grown, as well as In₂Se₃.

Fundamental to EC-ALE is the formation of compounds an atomic layer at a time, so much effort has been directed to atomic level studies of these layers as they form. These studies involve use of UHV-EC techniques, where the depositions are performed in an antechamber attached directly to a UHV surface analysis instrument. LEED, Auger, and XPS are used to follow deposit formation. In addition, in-situ STM studies are performed. Recent results with atomic layers of Cd and S will be described, as well as some work with a flow cell in-situ STM.