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Sputter Deposition System for High Throughput Fabrication of Composition Spread Thin Films[1] JOHN GREGOIRE, FRANK DISALVO, HECTOR ABRUNA, ROBERT BRUCE VAN DOVER, Cornell University — We describe a custom built sputtering system that can deposit composition spreads in an effectively UHV environment but which does not require the high-throughput paradigm to be compromised by a long pumpdown each time a target is changed. The system employs four magnetron sputter guns in a cryoshroud (getter sputtering) which allows elements such as Ti and Zr to be deposited with minimal contamination by oxygen or other reactive background gasses. Other features of the deposition system will be presented, most notably the ability to quickly measure deposition profiles from individual deposition sources. We discuss the possibility of calculating codeposited film composition from these profiles, noting that codeposition affords resputtering phenomena which are absent in single-source deposition. To demonstrate the efficacy of this system, we describe our study of combinatorial libraries of electrocatalyst materials for fuel cell applications. This study includes a high-throughput parallel screening of composition spreads using a fluorescence indicator.

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