Chemical Synthesis, Modification, and Kinetic Investigation of Layered Metal Oxide Water Oxidation Catalysis

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- **Key Features**
  - Synthesis and Characterization of molecules and materials
  - Air sensitive preparation and handling
  - X-ray crystallographic structure determination
  - Kinetic and mechanistic investigation of catalytic reaction chemistry.
  - Spectroscopy (NMR, IR, absorption, EPR)

- **Effort**
  - Synthesis of layered metal oxides (i.e. MnO₂) material for water oxidation catalysis
  - Refinement of metal oxide catalysts via doping, charge and oxidation state distribution, surface modification
  - Chemical precursor design and synthesis

Surface decoration of δ-MnO₂ with Mn³⁺ exhibits 50-fold increase over undecorated catalysts.

State of the art Bruker Kappa APEX II DUO x-ray diffractometer features dual copper and molybdeum x-ray source, Oxford cryostream, and Kappa 4-circle goniometer. Capable of both single crystal and powder characterization