

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



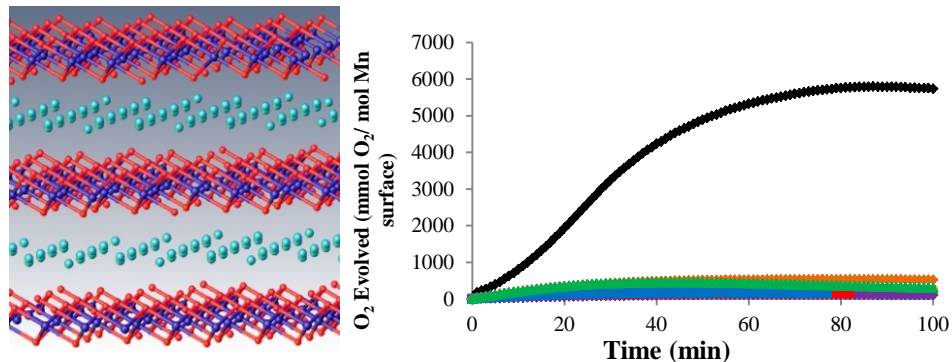
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- **Key Features**

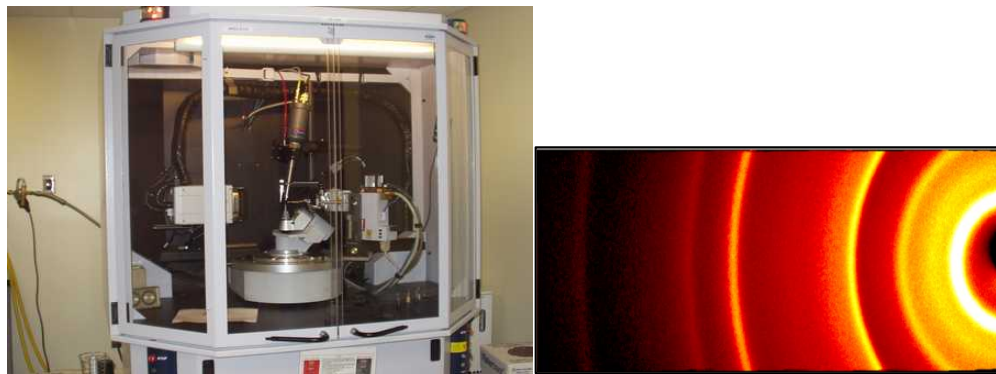
- Synthesis and Characterization of molecules and materials
- Air sensitive preparation and handling
- X-ray crystallographic structure determination
- Kinetic and mechanistic investigation of catalytic reaction chemistry.
- Spectroscopy (NMR, IR, absorption, EPR)

- **Effort**

- Synthesis of layered metal oxides (i.e. MnO_2) 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 $\delta\text{-MnO}_2$ with Mn^{3+} exhibits 50-fold increase over undecorated catalysts.



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