

**Heteroepitaxial Nucleation and Oriented Growth of Manganese Oxide Islands on
Carbonate Minerals under Aqueous Conditions**

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Supporting Information:

1 Page

1 Figure

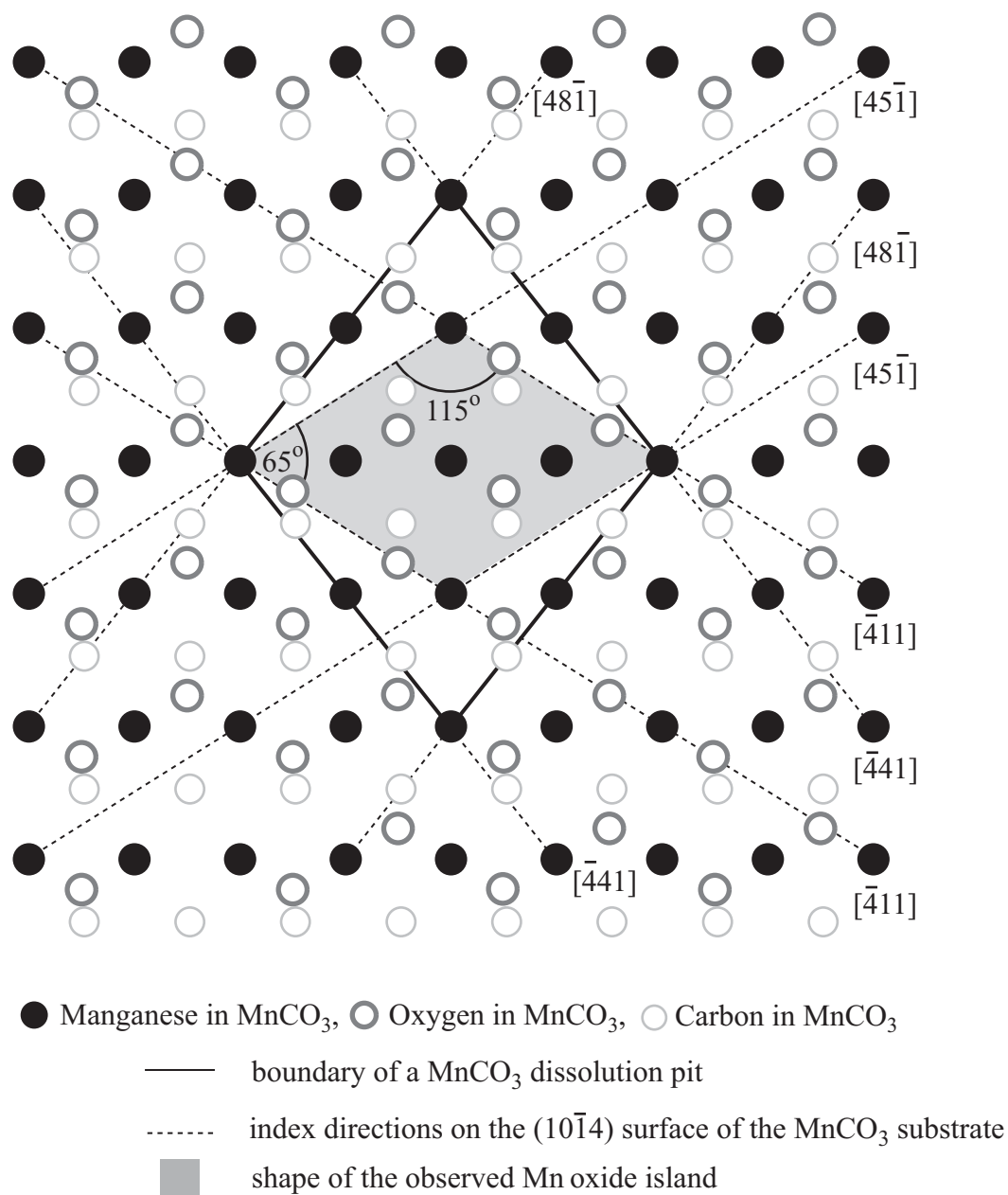


Figure S1. Hypothesized positioning of the Mn oxide island on an unreconstructed $(10\bar{1}4)$ MnCO_3 surface. Each line shows an index direction on the $(10\bar{1}4)$ surface of MnCO_3 . The island edges are parallel to the $[45\bar{1}]$ and $[\bar{4}11]$ directions of the substrate. The intersection of the $[45\bar{1}]$ and $[\bar{4}11]$ directions creates 65° and 115° angles, which are similar to the inner angles (viz. 68° and 112° angles) of the observed Mn oxide islands.