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Figure Captions

Figure S1. UV spectra of (a) reactants (L¹RhH²⁺ and Cr_{aq}OO²⁺) and (b) products (L¹RhOO²⁺ and Cr_{aq}OOH²⁺) of reaction 13 (L = L¹) in O₂-saturated 0.1 M HClO₄.

Figure S2. Plot of k_{ψ} against [(NH₃)₄RhH²⁺] for the reaction between L¹RhOO²⁺ and (NH₃)₄RhH²⁺ under argon.

Figure S3. Initial portion of a kinetic trace at 240 nm for the reaction between 0.022 mM $(NH_3)_4RhOO^{2+}$ and 0.72 mM L^1RhH^{2+} in O_2 -saturated 0.1 M HClO₄. The exponential absorbance increase in the first ~150 s corresponds to the stoichiometric reaction between the two reactants. This is followed by the much slower catalytic conversion of L^1RhH^{2+} to L^1RhOOH^{2+} , which takes several hours for completion.



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