## Chloride-assisted catalytic water oxidation

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Supplementary Information



**Figure S1.** Cyclic voltammograms of GC electrode in the presence of different amounts of NaCl, as indicated in the figure. Solution, pH 7.0 (0.1 M NaH<sub>2</sub>PO<sub>4</sub>/Na<sub>2</sub>HPO<sub>4</sub>); scan rate, 100 mV/s.

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**Figure S2.** Cyclic voltammograms of 1 mM **1** at GC electrode in the absence (red) and presence (blue) of 50 mM NaCl. Scan rate, 100 mV/s. (A) pH 1.0 (0.1 M HNO<sub>3</sub>); (B) pH 3.0 (0.1 M H<sub>3</sub>PO<sub>4</sub>/NaH<sub>2</sub>PO<sub>4</sub>); (C) pH 5.0 (0.1 M CH<sub>3</sub>CO<sub>2</sub>H/CH<sub>3</sub>CO<sub>2</sub>Na).



**Figure S3.** (A) Cyclic voltammograms of different amounts of 1, as indicated in the figure, at GC electrode in the presence of 1 mM NaCl. Solution, pH 7.0 (0.1 M NaH<sub>2</sub>PO<sub>4</sub>/Na<sub>2</sub>HPO<sub>4</sub>); scan rate, 100 mV/s. (B) As in (A), plot of  $i_{cat}$  vs [1].



**Figure S4.** Cyclic voltammograms of 1 mM **1** at GC electrode in the presence of 10 mM NaCl. Scan rate, 100 mV/s. Solution, pH 7.0. The concentration of the phosphate buffer is indicated in the figure and the ionic strength was kept constant by adding NaNO<sub>3</sub>. Similar results were obtained with added 50 mM NaCl.



**Figure S5.** Cyclic voltammograms of 1 mM [Ru(Mebimpy)(bpz)(OH<sub>2</sub>)]<sup>2+</sup> at GC electrode in the absence (red) and presence (blue) of 50 mM NaCl. Scan rate, 100 mV/s. (A) pH 1.0 (0.1 M HNO<sub>3</sub>); (B) pH 3.0 (0.1 M H<sub>3</sub>PO<sub>4</sub>/NaH<sub>2</sub>PO<sub>4</sub>); (C) pH 5.0 (0.1 M CH<sub>3</sub>CO<sub>2</sub>H/CH<sub>3</sub>CO<sub>2</sub>Na).



**Figure S6.** Cyclic voltammograms of 1 mM [Ru(tpy)(bpy)(OH<sub>2</sub>)]<sup>2+</sup> at GC electrode in the absence (red) and presence (blue) of 50 mM NaCl at pH 7.0 (0.1 M NaH<sub>2</sub>PO<sub>4</sub>/Na<sub>2</sub>HPO<sub>4</sub>). Scan rate, 100 mV/s.



**Figure S7.** CVs of  $[Ru^{II}(bpy)_2(4,4'-((HO)_2OPCH_2)_2bpy)]^{2+}$  adsorbed on ITO at pH 5.0 (0.1 M CH<sub>3</sub>CO<sub>2</sub>H/CH<sub>3</sub>CO<sub>2</sub>Na) with addition of increasing amounts of NaCl as indicated in the figure. Scan rate, 100 mV/s.



**Figure S8.** UV-Vis spectra of 60  $\mu$ M **1** at pH 7.0 (0.1 M NaH<sub>2</sub>PO<sub>4</sub>/Na<sub>2</sub>HPO<sub>4</sub>) with different amounts of added NaCl before (red) and after (blue) 18 h. Time-dependent spectral shift was observed with 0.5 M NaCl and more pronounced with 3.5 M NaCl.