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**Supporting Information**

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# Catalytic performance of Cr-doped ruthenium oxides for acidic oxygen evolution reaction in water electrolysis

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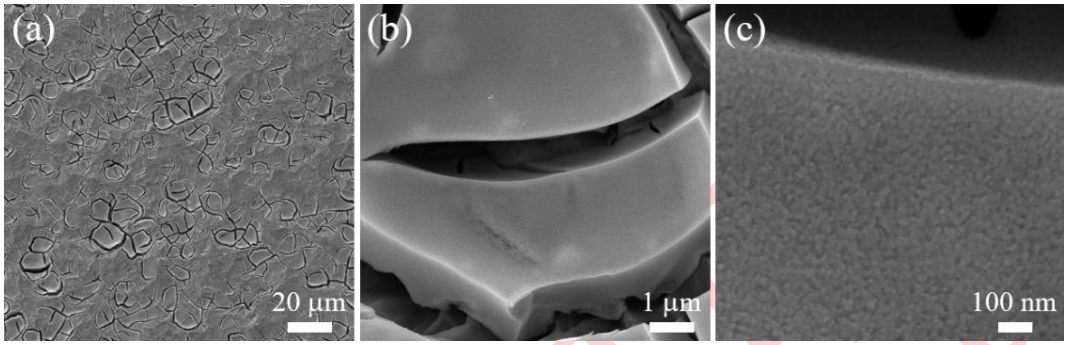



Fig. S1. SEM images of undoped py-$RuO_2$ at different resolutions.

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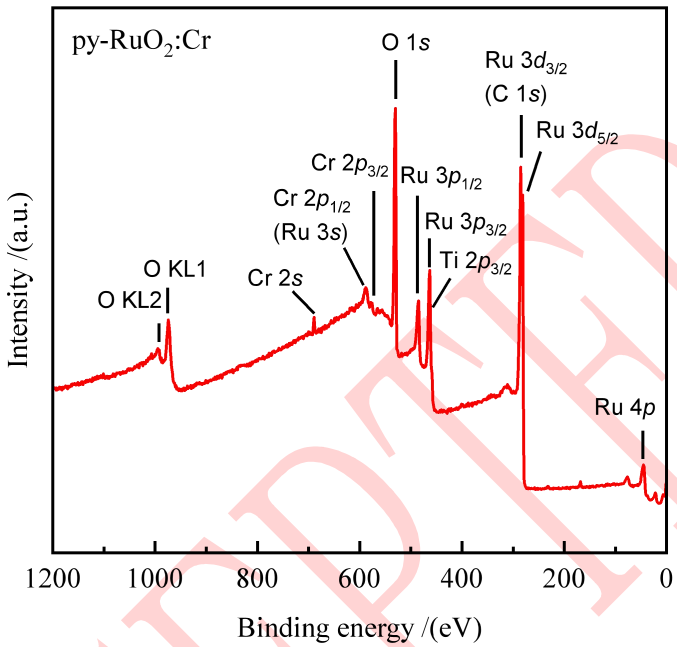



Fig. S2. XPS survey spectrum of the as-prepared py-$RuO_2$:Cr.

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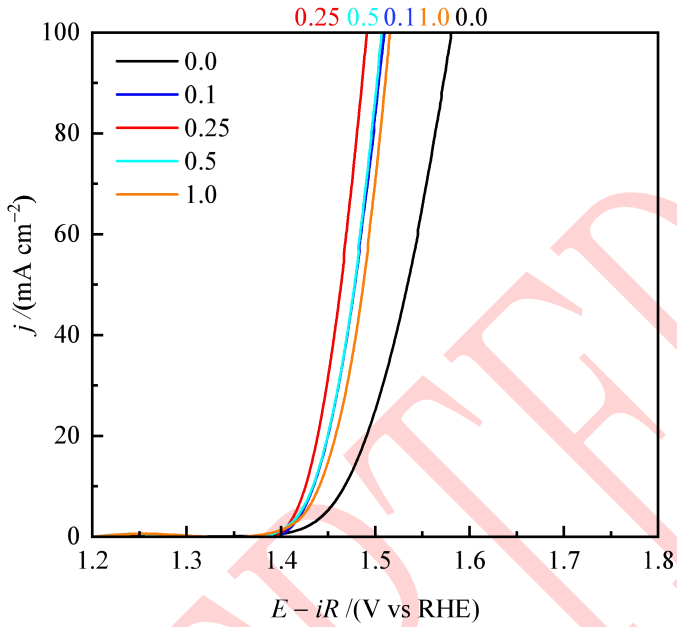



Fig. S3. LSV curves of py-$RuO_2$:Cr with different Cr/Ru molar ratios.

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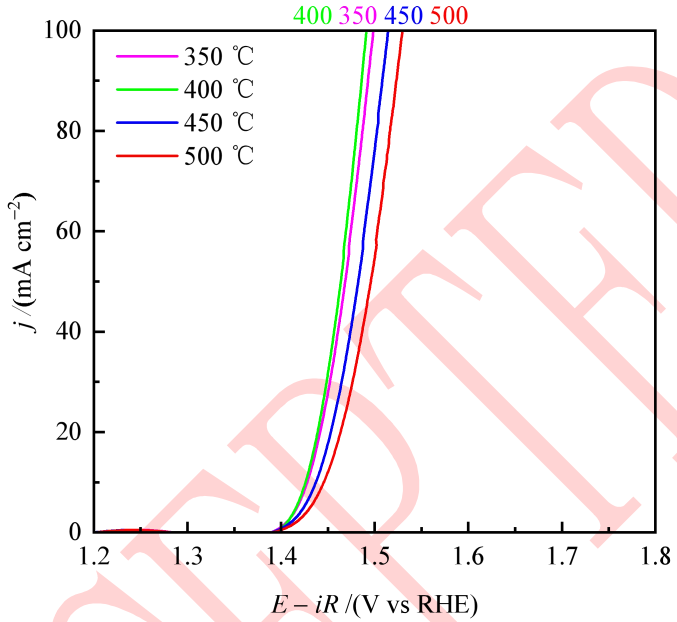



Fig. S4. LSV curves of py-$RuO_2$:Cr prepared under different temperature.

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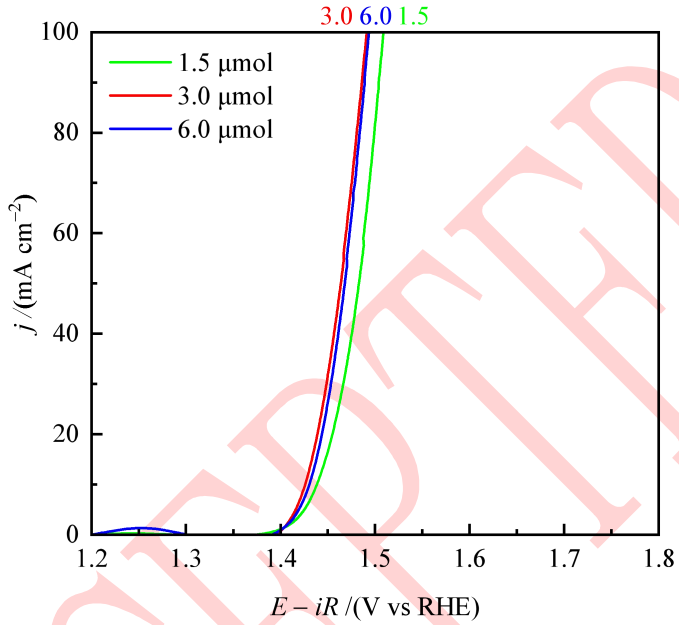



Fig. S5. LSV curves of py-$RuO_2$:Cr prepared with different Ru loadings.

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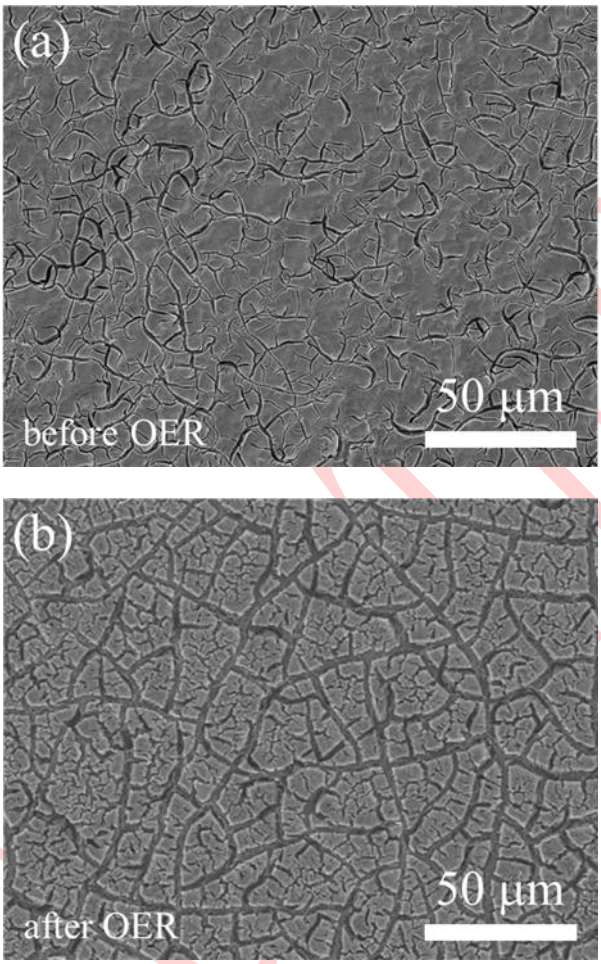



Fig. S6. SEM images of py-$RuO_2$ :Cr (a) before and (b) after the stability test.

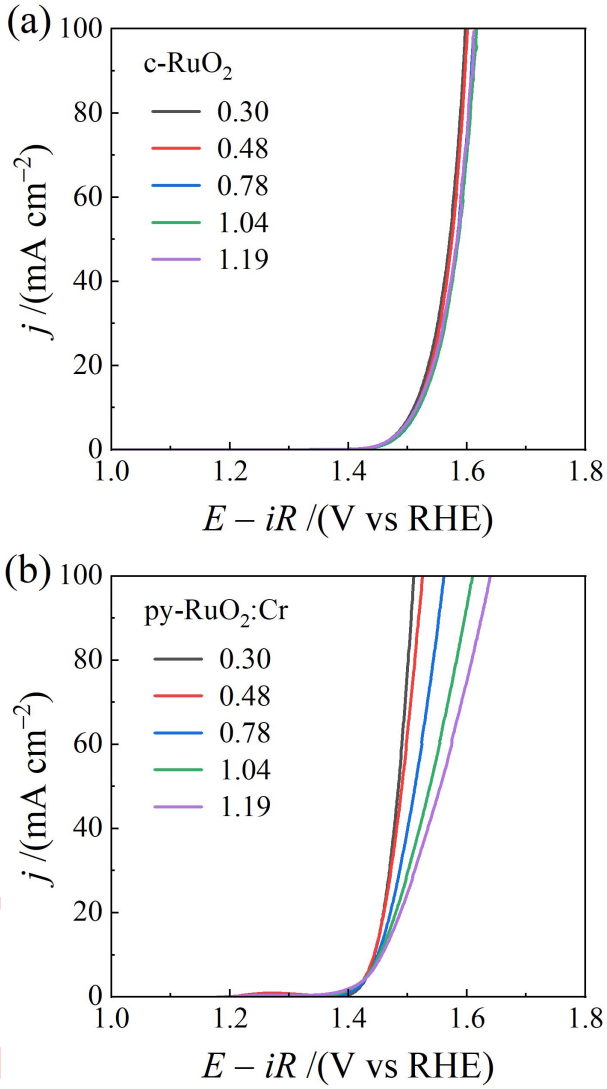



Fig. S7. LSV curves of (a) c-$RuO_2$ and (b) py-$RuO_2$:Cr in $H_2SO_4$ electrolytes with varying pH value.

**Table S1.** Quantification of elements analyzed by ICP-OES.

| Samples | Ru（mg $cm^{-2}$） | Cr（mg $cm^{-2}$） |
|---|---|---|
| py-$RuO_2$:Cr (as-prepared) | 0.267[a] | 0.051[a] |
| dissolved after the stability test | 0.061[b] | 0.018[b] |

[a] Average values that were collected on four samples independently prepared.

[b] The OER stability test was performed on the Ti supported py-$RuO_2$:Cr catalyst in 0.5 M $H_2SO_4$ electrolyte at 10 mA $cm^{-2}$ for 500 h.

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