

Supplementary Information

Ultra-Precise Ruler for Ammonia Nitrogen Quantification in Electrochemical Synthesis Experiments

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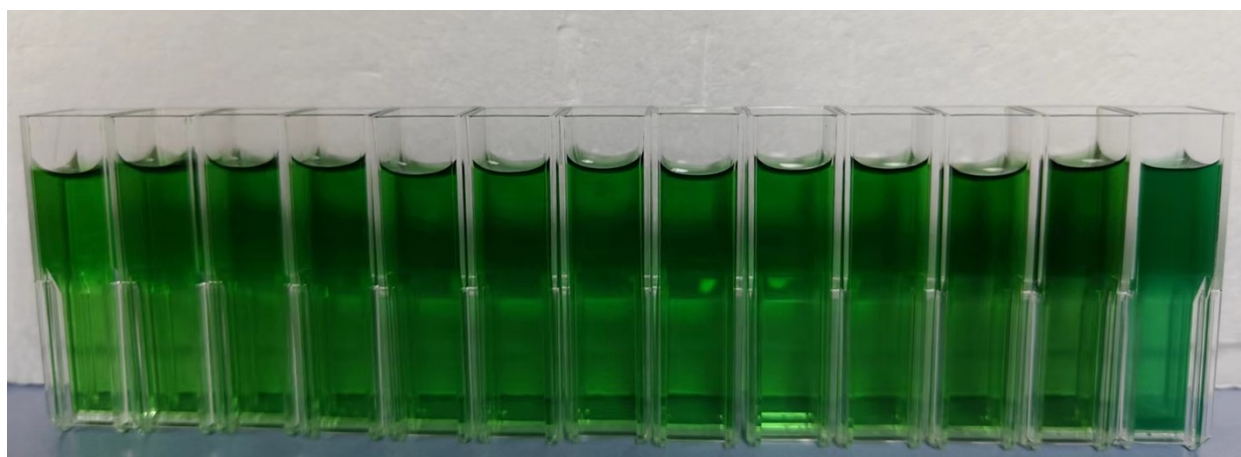
KEYWORDS: Ammonia Nitrogen Quantification, Electrochemical Synthesis, Nitrate Reduction Reaction, Ultra-Precise Ruler, Algorithm optimization.

These authors contributed equally to this work.

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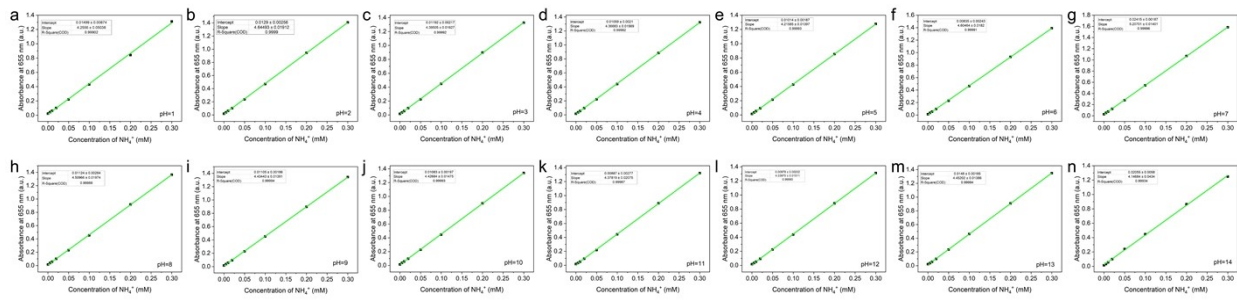
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1. Detection of NH₃ using indophenol blue method under various 0.02 mM metal ions



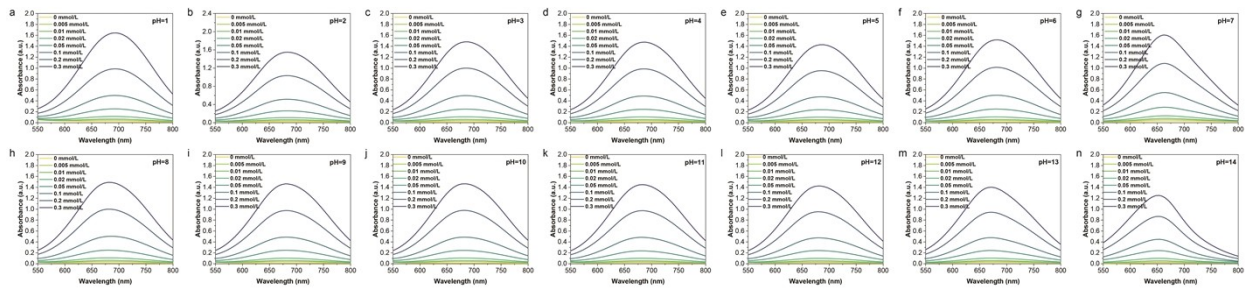
Supplementary Figure 1 | Detection of NH₃ using indophenol blue method under various 0.02 mM metal ions.

2. Calibration curves for NH₃ detection using the indophenol blue method under various pH



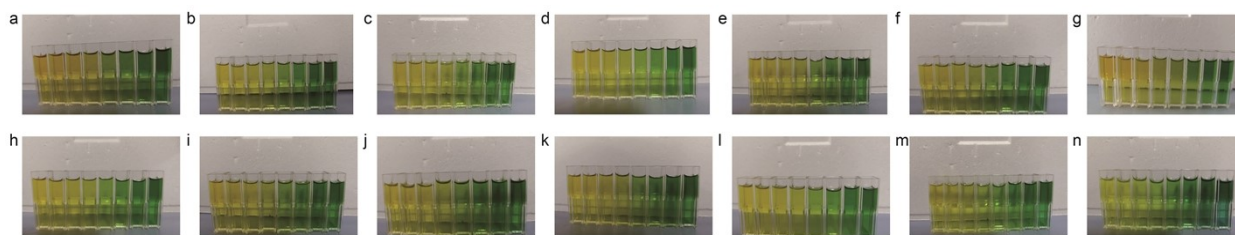
Supplementary Figure 2 | Calibration curves for NH₃ detection using the indophenol blue method under a) pH 1, b) pH 2, c) pH 3, d) pH 4, e) pH 5, f) pH 6, g) pH 7, h) pH 8, i) pH 9, j) pH 10, k) pH 11, l) pH 12, m) pH 13, n) pH 14.

3. Absorbance and wavelength of NH₃ detection using the indophenol blue method under various pH



Supplementary Figure 3 | Absorbance and wavelength of NH₃ detection using the indophenol blue method under a) pH 1, b) pH 2, c) pH 3, d) pH 4, e) pH 5, f) pH 6, g) pH 7, h) pH 8, i) pH 9, j) pH 10, k) pH 11, l) pH 12, m) pH 13, n) pH 14.

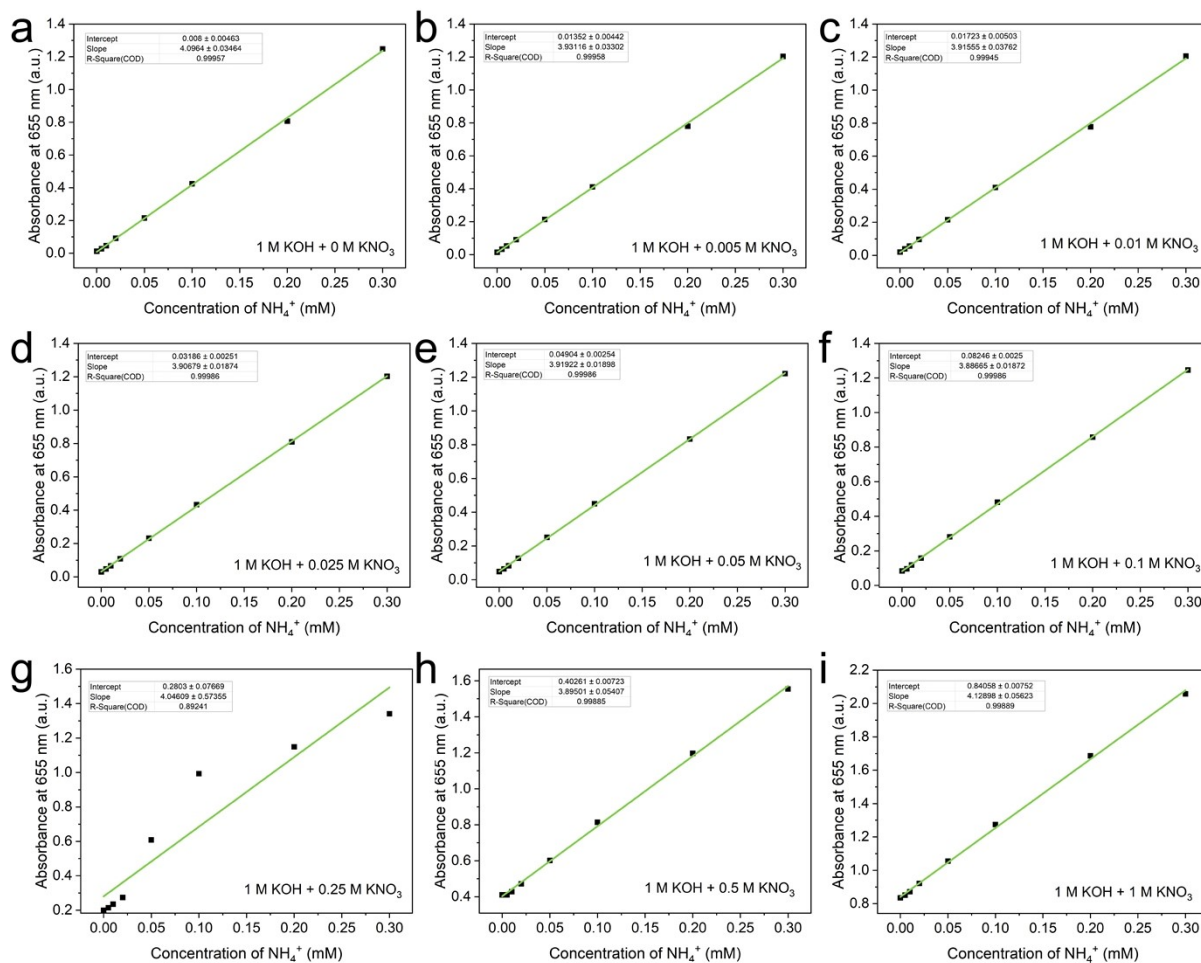
4. Detection of NH_3 detection using the indophenol blue method under various pH



Supplementary Figure 4 | Detection of NH_3 detection using the indophenol blue method under

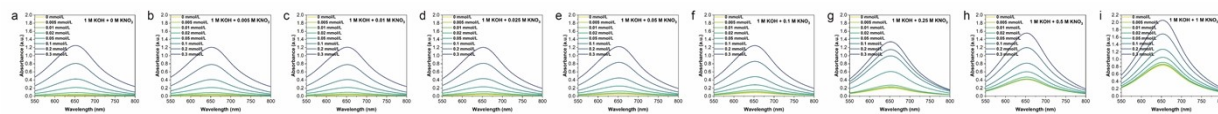
a) pH 1, b) pH 2, c) pH 3, d) pH 4, e) pH 5, f) pH 6, g) pH 7, h) pH 8, i) pH 9, j) pH 10, k) pH 11, l) pH 12, m) pH 13, n) pH 14.

5. Calibration curves for NH₃ detection using the indophenol blue method under different concentrations of KNO₃



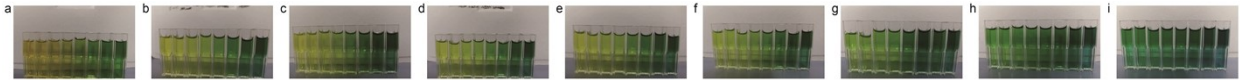
Supplementary Figure 5 | Calibration curves for NH₃ detection using the indophenol blue method under a) 0 M, b) 0.005 M, c) 0.01 M, d) 0.025 M, e) 0.05 M, f) 0.1 M, g) 0.25 M, h) 0.5 M, i) 1 M KNO₃.

6. Absorbance and wavelength of NH_3 detection using the indophenol blue method under different concentrations of KNO_3



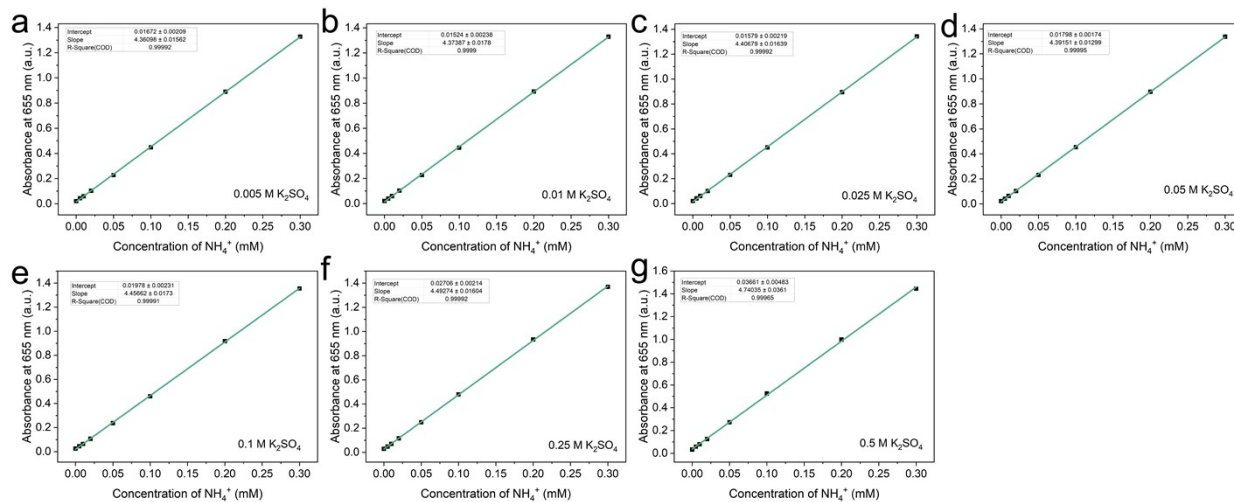
Supplementary Figure 6 | Absorbance and wavelength of NH_3 detection using the indophenol blue method under a) 0 M, b) 0.005 M, c) 0.01 M, d) 0.025 M, e) 0.05 M, f) 0.1 M, g) 0.25 M, h) 0.5 M, i) 1 M KNO_3 .

7. Detection of NH_3 using indophenol blue method under different concentrations of KNO_3



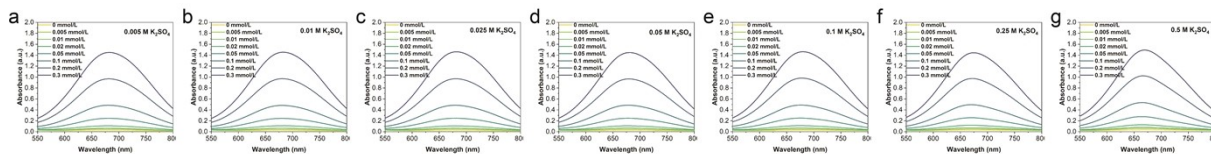
Supplementary Figure 7 | Detection of NH_3 using indophenol blue method under a) 0 M, b) 0.005 M, c) 0.01 M, d) 0.025 M, e) 0.05 M, f) 0.1 M, g) 0.25 M, h) 0.5 M, i) 1 M KNO_3 .

8. Calibration curves for NH₃ detection using the indophenol blue method under different concentrations of K₂SO₄



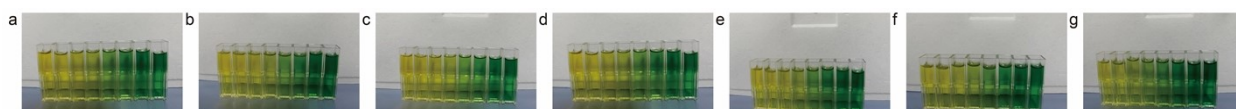
Supplementary Figure 8 | Absorbance and wavelength of NH₃ detection using the indophenol blue method under a) 0.005 M, b) 0.01 M, c) 0.025 M, d) 0.05 M, e) 0.1 M, f) 0.25 M, g) 0.5 M K₂SO₄.

9. Absorbance and wavelength of NH₃ detection using the indophenol blue method under different concentrations of K₂SO₄



Supplementary Figure 9 | Absorbance and wavelength of NH₃ detection using the indophenol blue method under a) 0.005 M, b) 0.01 M, c) 0.025 M, d) 0.05 M, e) 0.1 M, f) 0.25 M, g) 0.5 M K₂SO₄.

10. Detection of NH_3 using indophenol blue method under different concentrations of K_2SO_4



Supplementary Figure 10 | Detection of NH_3 using indophenol blue method under a) 0.005 M, b) 0.01 M, c) 0.025 M, d) 0.05 M, e) 0.1 M, f) 0.25 M, g) 0.5 M K_2SO_4 .