

Fast Determination of Iodine Number of Biodiesel Using Capillary Zone Electrophoresis with Multi- and Single-Point Calibration

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Table S1. Optimization of the BGE by Peakmaster 5.3 simulation

| BGE composition | | Ionic strength / (mmol L ⁻¹) | Buffer capacity / (mmol L ⁻¹) | Γ EMD | EMD | | pH |
|-------------------------------|---|---|---|--------|------------------------------|---|------|
| HCl / (mmol L ⁻¹) | 6-Aminocaproic acid ^a / (mmol L ⁻¹) | | | | NO ₃ ⁻ | S ₂ O ₃ ²⁻ | |
| 10.00 | 20.00 | 10.00 | 11.86 | 0.0633 | 0.646 | -0.556 | 4.42 |
| 10.00 | 30.00 | 10.00 | 15.83 | 0.0629 | 0.641 | -0.554 | 4.71 |
| 10.00 | 40.00 | 10.00 | 17.83 | 0.0629 | 0.640 | -0.555 | 4.89 |
| 10.00 | 50.00 | 10.00 | 19.07 | 0.0627 | 0.639 | -0.556 | 5.02 |
| 10.00 | 60.00 | 10.00 | 19.89 | 0.0626 | 0.639 | -0.556 | 5.12 |
| 10.00 | 70.00 | 10.00 | 20.48 | 0.0626 | 0.638 | -0.556 | 5.19 |
| 10.00 | 80.00 | 10.00 | 20.92 | 0.0626 | 0.638 | -0.556 | 5.26 |
| 10.00 | 90.00 | 10.00 | 21.27 | 0.0626 | 0.638 | -0.556 | 5.32 |
| 10.00 | 100.00 | 10.00 | 21.54 | 0.0625 | 0.638 | -0.556 | 5.37 |

^aPeakmaster master data shows 6-aminocaproic acid as e-aminocaproic acid. BGE: background electrolyte; EMD: electromigration dispersion.

Table S2. Linearity evaluation for MPC and experimental values for F_{exp} and r^2 calculation. The SPC was developed using the response factor (equation 2)

| MPC ^a | SPC ^a | Common values for both calibration modes | | | |
|----------------------------|---------------------------------|--|-----------------------------------|-----------------------------------|---|
| | | 1 st replicate | 2 nd replicate | 3 rd replicate | Average response |
| $C_i / (\text{mg L}^{-1})$ | $\frac{C_i}{C_{\text{NO}_3^-}}$ | $\frac{Ar_i}{Ar_{\text{NO}_3^-}}$ | $\frac{Ar_i}{Ar_{\text{NO}_3^-}}$ | $\frac{Ar_i}{Ar_{\text{NO}_3^-}}$ | $\frac{\overline{Ar}_i}{\overline{Ar}_{\text{NO}_3^-}}$ |
| 10.000 | 0.200 | 0.127 | 0.138 | 0.138 | 0.134 |
| 20.000 | 0.400 | 0.251 | 0.260 | 0.256 | 0.256 |
| 30.000 | 0.600 | 0.365 | 0.378 | 0.379 | 0.374 |
| 40.000 | 0.800 | 0.486 | 0.512 | 0.517 | 0.505 |
| 60.000 | 1.200 | 0.747 | 0.760 | 0.768 | 0.759 |
| 70.000 | 1.400 | 0.861 | 0.885 | 0.892 | 0.879 |
| 90.000 | 1.800 | 1.126 | 1.115 | 1.145 | 1.129 |

^aFor multi-point calibration (MPC) and single-point calibration (SPC): $F_{\text{calculated}} = 0.296$; $F_{(0.05,5,14)} = F_{\text{critical}}=2.958$. C_i and $C_{\text{NO}_3^-}$: concentration of Γ or NO_3^- for a specific calibration level, respectively; Ar_i and $Ar_{\text{NO}_3^-}$: peak areas of Γ and NO_3^- for a specific calibration level, respectively.