

Supplementary Data

Figures

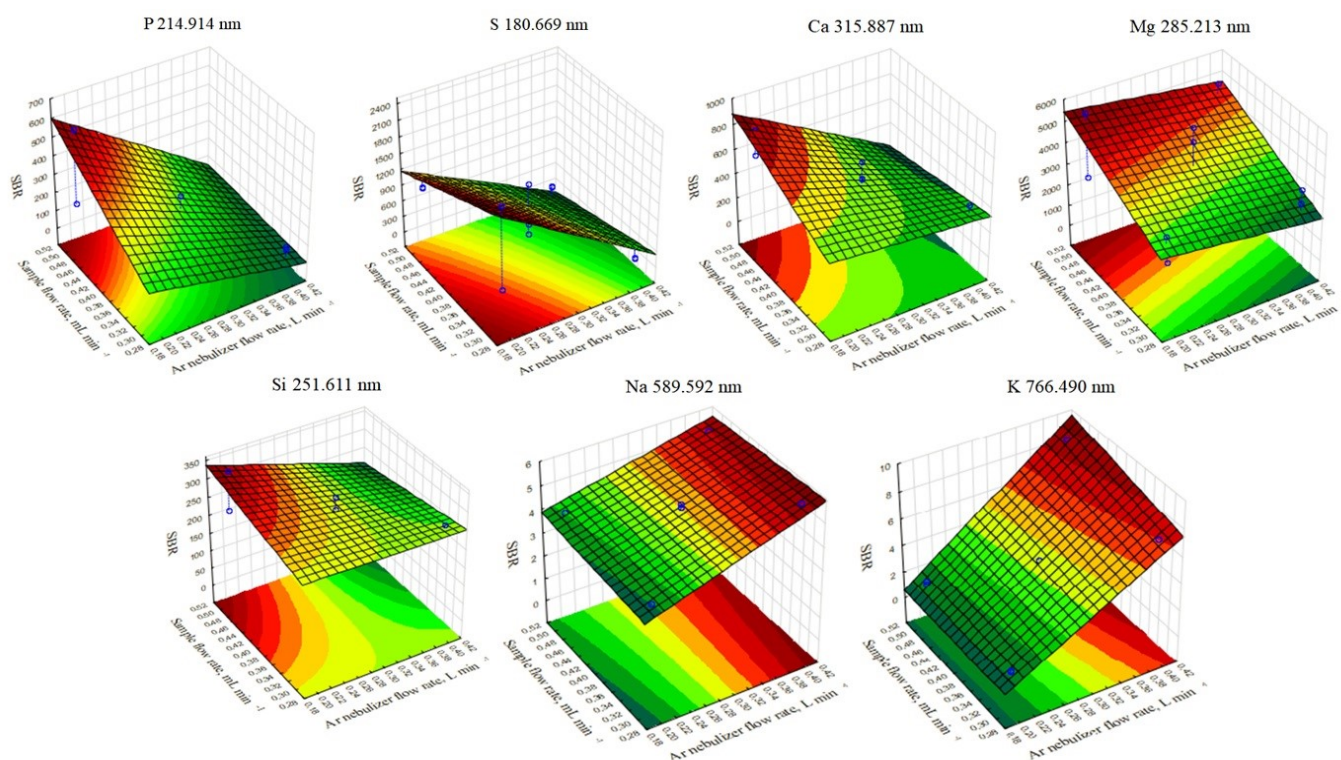


Figure S1 - Response surfaces for the analytes' SBR over the sample and Ar nebulizer flow rates, obtained by 2-level full factorial design with replication at the center point, for the spectral lines: P 214.914 nm, S 180.669 nm, Ca 315.887 nm, Mg 285.213 nm, Si 251.611 nm, Na 589.592 nm, and K 766.490 nm.

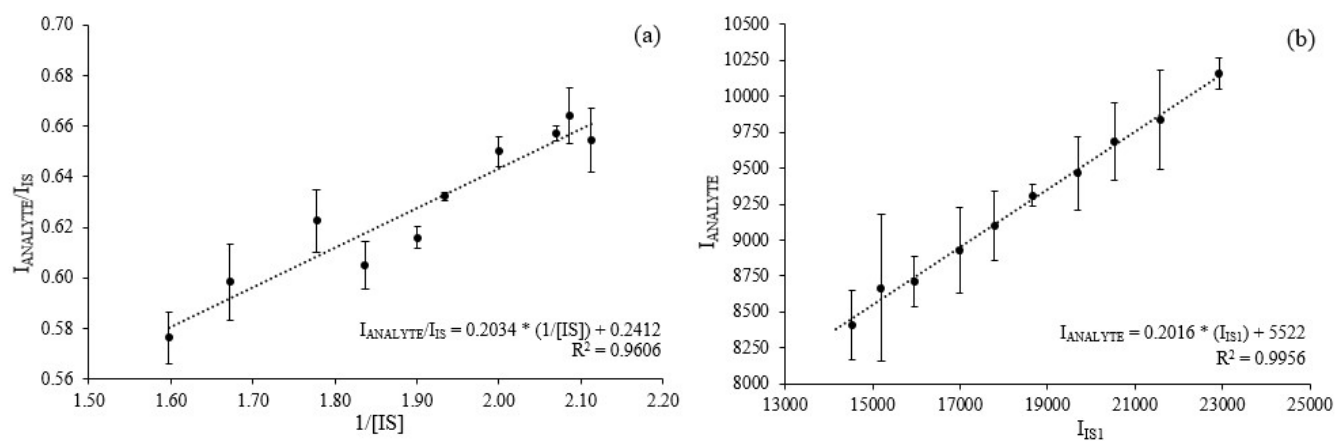


Figure S2 - Analytical curves obtained by SDA method with one (a) and two (b) internal standards for determination of Ca, at 315.887 nm, in biodiesel sample ($n = 3$).

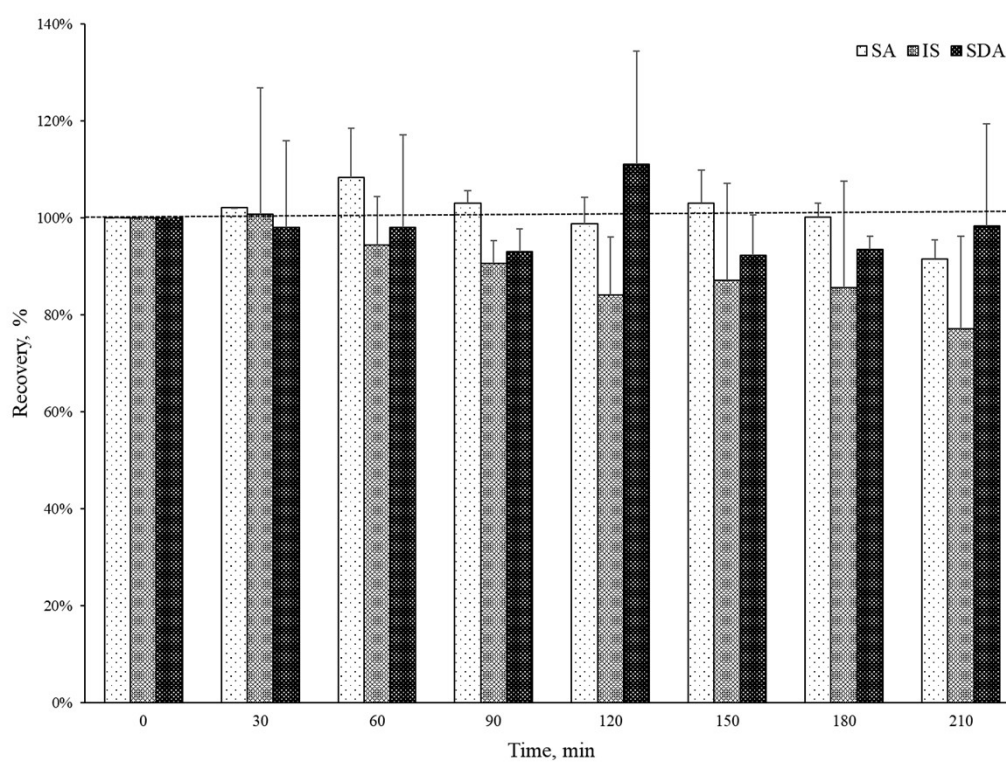


Figure S3 - Analytical frequency test for S in biodiesel sample applying IS, SA and SDA calibration methods ($n = 3$).

Tables

Table S1 - Selected wavelengths and view mode for Na, K, Ca, Mg, P, Si, and S determination in biodiesel samples by ICP OES

| Element | Wavelengths (λ , nm) | View mode |
|---------|-------------------------------|-----------|
| Na | 589.592 (I) | Radial |
| K | 766.490 (I) | Radial |
| Ca | 315.887 (II) | Radial |
| Mg | 285.213 (I) | Radial |
| P | 214.914 (I) | Axial |
| Si | 251.611 (I) | Axial |
| S | 180.669 (I) | Axial |

(I): Atomic line (II): Ionic line

Table S2 - Experimental matrix used for the 2-level full factorial design (2^3) with replication at the center point

| Parameters | Levels | | |
|---|--------|------|------|
| | - | 0 | + |
| Ar nebulizer flow rate, L min ⁻¹ | 0.2 | 0.3 | 0.4 |
| Sample flow rate, mL min ⁻¹ | 0.3 | 0.4 | 0.5 |
| Radiofrequency (RF) power, W | 1300 | 1400 | 1500 |