

Dielectric barrier discharge-optical emission spectrometry for the simultaneous determination of halogens

Deng-Ji Zhang,^a Yi Cai,^a Ming-Li Chen,^a Yong-Liang Yu,^{*ab} and Jian-Hua Wang^{*a}

^a *Research Center for Analytical Sciences, College of Sciences, Northeastern University, Box 332, Shenyang 110819, China*

^b *Department of Chemistry, College of Sciences, Northeastern University, Box 332, Shenyang 110819, China*

Electronic Supplementary Information

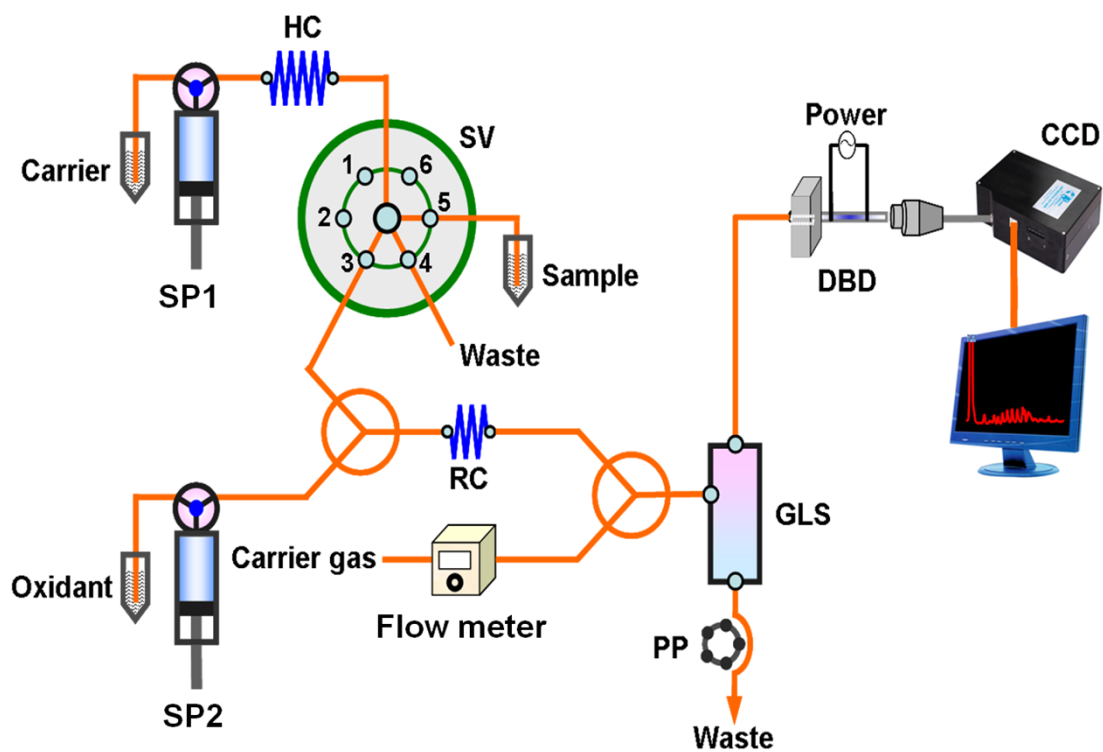


Figure S1. Schematic diagram of the DBD-OES system for the simultaneous determination of halides. SP1, SP2: syringe pumps; SV: 6-port selection valve; PP: peristaltic pump; HC: holding coil; RC: reaction coil; GLS: gas-liquid separator.

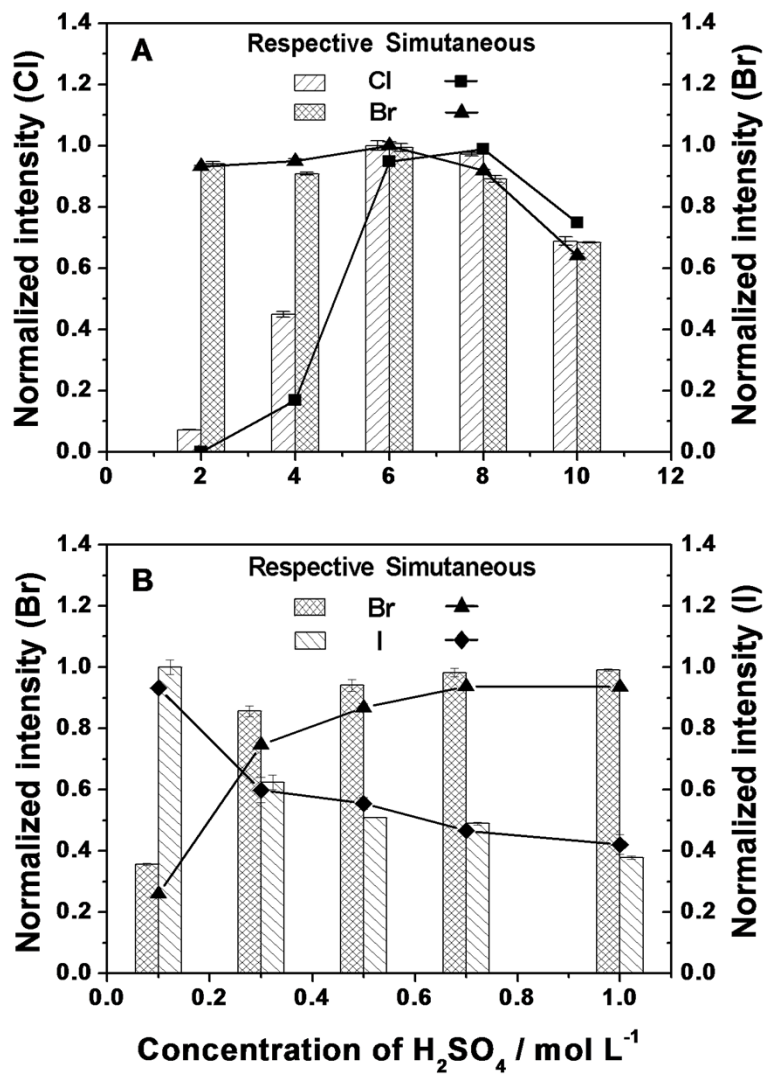


Figure S2. The acidity-dependent optical emission intensity for the halogens. (A): Simultaneous and respective determinations of Cl and Br by reaction with 0.1 mol L⁻¹ KMnO₄; (B): Simultaneous and respective determinations of Br and I by reaction with 0.02 mol L⁻¹ KMnO₄.

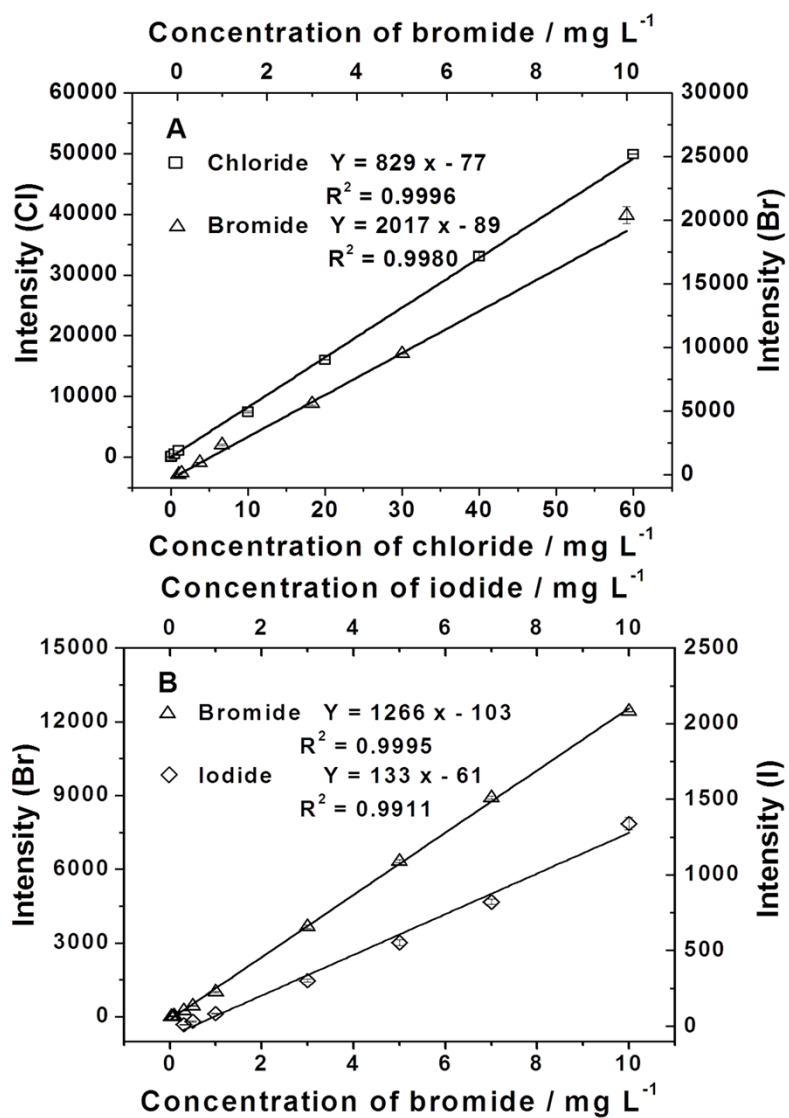


Figure S3. The calibration curves of halides obtained by the present system. (A): Simultaneous determination of Cl and Br; (B): Simultaneous determination of Br and I.

Table S1. The experimental parameters of the DBD-OES system for the simultaneous determination of halides

Parameter	Cl and Br Determination	Br and I Determination
Sample volume	1 mL	1 mL
Detection wavelength	Cl 837 nm; Br 827 nm	Br 827 nm; I 905 nm
Discharge input voltage	85 V _{AC}	85 V _{AC}
Distance between two electrodes	25 mm	25 mm
Helium flow rate	150 mL min ⁻¹	200 mL min ⁻¹
Sample loading flow rate	9 mL min ⁻¹	24 mL min ⁻¹
Reaction time	0 s	15 s
KMnO ₄ concentration	0.1 mol L ⁻¹	0.02 mol L ⁻¹
H ₂ SO ₄ concentration	6 mol L ⁻¹	0.5 mol L ⁻¹