

Rapid, *in situ* Detection of Cocaine Residues Based on Paper Spray Ionization Coupling with Ion Mobility Spectrometry

Ming Li,^b Jingjing Zhang,^c Jie Jiang,^{a*} Jing Zhang,^a Jing Gao,^a Xiaolin Qiao^c

^a School of Marine Science and Technology, Harbin Institute of Technology at Weihai, Weihai,
264209 P. R. China

^b Division of Chemical Metrology & Analytical Science, National Institute of Metrology,
Beijing, 100013 P. R. China

^c School of Information and Electrical Engineering, Harbin Institute of Technology at Weihai,
Weihai, 264209 P. R. China

Corresponding Author

Dr. Jie Jiang, School of Marine Science and Technology, Harbin Institute of Technology at Weihai,
Weihai, Shandong Province 264209, P. R. China, Fax: (86)-631-5685-359 Email: hitjiangjie@gmail.com

Supporting Information

Calculation of Townsend value

The Townsend value was calculated according to the equation (1):

$$Td = E/N \cdot 10^{17} \text{ V cm}^2 \quad (1)$$

Where E is the electric field, and N is the number density of the buffer gas. An electric field of 370 V/cm was used in this study and the number density of the buffer gas was about $2.45 \times 10^{19} / \text{cm}^3$ under experimental conditions. Therefore, the Townsend value was calculated to be 1.5 Td.

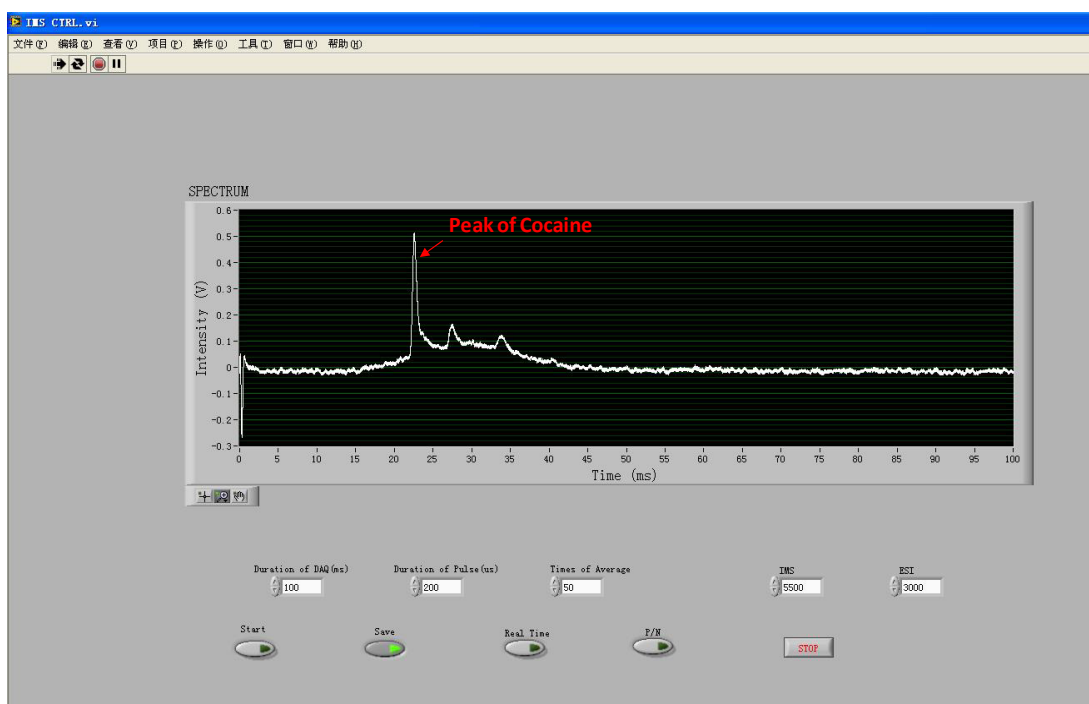


Figure S1 The original IMS spectrum of 100 ng cocaine on fingernail.

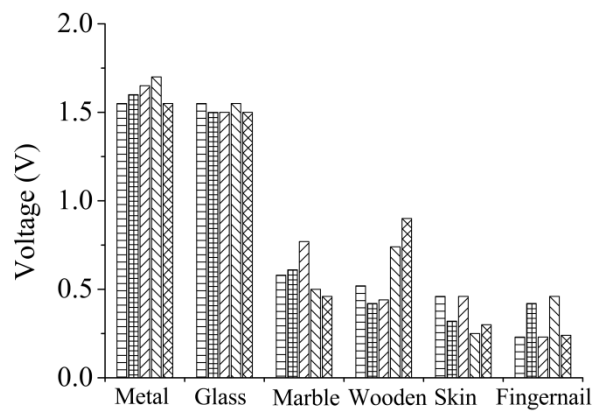


Figure S2 Analytical results for the analysis of cocaine residues on smooth surfaces based on PSI-IMS

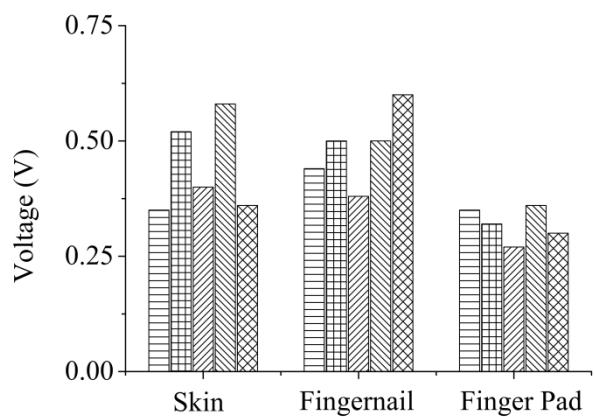


Figure S3 Analytical results for the analysis of cocaine residues on unsmooth surfaces based on PSI-IMS

Table S1 The intensity of 100 ng cocaine residence on different surfaces

Material	Metal	Glass	Marble	Wood	Skin	Fingernail
Intensity	1.55	1.55	0.58	0.52	0.46	0.24
	1.6	1.55	0.61	0.42	0.32	0.23
	1.65	1.5	0.77	0.44	0.46	0.23
	1.7	1.5	0.5	0.74	0.25	0.42
	1.55	1.55	0.46	0.9	0.3	0.33
RSD(%)	6.5	2.7	12.0	20.9	9.7	8.4

Table S2 The intensity of 100 ng cocaine residence on different position of hand

Surface	Skin	Fingernail	Finger Pad
Intensity	0.36	0.5	0.3
	0.35	0.44	0.36
	0.52	0.6	0.35
	0.4	0.38	0.32
	0.58	0.5	0.27
RSD(%)	10.3	8.2	3.7