

## **Atomic fluorescence spectrometry for ultrasensitive determination of bismuth based on hydride generation – the role of excitation source, interference filter and flame atomizers**

Barbora Štádlerová,<sup>a,b,\*</sup> Marta Kolrosová,<sup>a,b</sup> Jiří Dědina,<sup>a</sup> and Stanislav Musil<sup>a</sup>

<sup>a</sup> Institute of Analytical Chemistry of the Czech Academy of Sciences, Veveří 97, 602 00 Brno, Czech Republic

<sup>b</sup> Charles University, Department of Analytical Chemistry, Hlavova 8, 128 43 Prague, Czech Republic

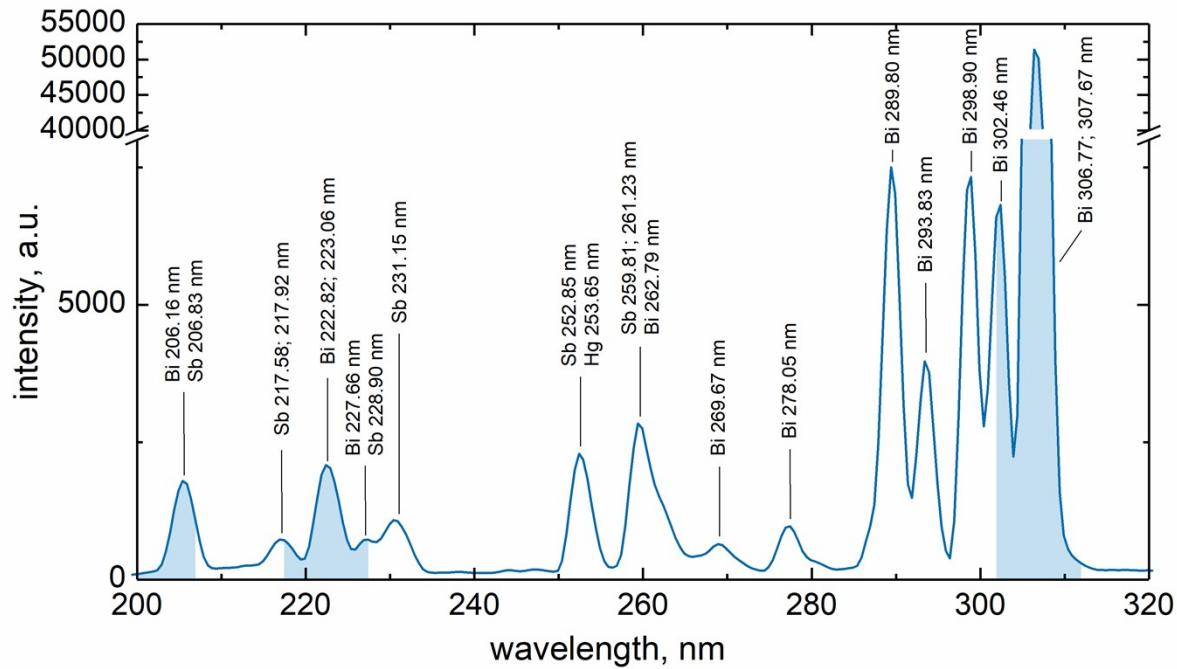
\* corresponding author; E-mail: stadlerova@iach.cz (B. Štádlerová)

### **Abstract**

This supplementary material describes in detail: the emission spectrum of Bi EDL (Fig. S1); dependence of peak area on the flow rate of inner Ar<sub>shield I</sub> and outer Ar<sub>shield II</sub> in FIGS (Fig. S2); and table with the results of the interference study (Table S1).

### 3 Results and discussion

#### 3.1 AFS instrument



*Fig. S1 Emission spectrum of Bi EDL (System II) obtained with a fiber optics UV-vis spectrometer. Transmission bandwidth (FWHM 10 nm) of 202, 223 and 307 nm filters shown in blue color for clarity.*

### 3.2 Optimization of atomization conditions

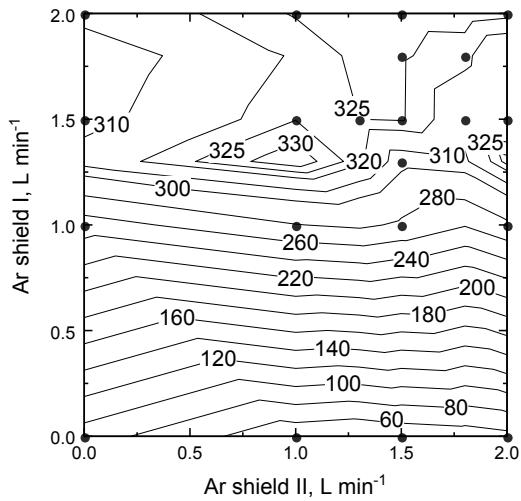


Fig. S2 Dependence of peak area on the flow rate of inner Ar<sub>shield</sub> I and outer Ar<sub>shield</sub> II; 1  $\mu\text{g L}^{-1}$  Bi, 500 mL min<sup>-1</sup> total gas flow rate, hydrogen fraction 13%, 7 mL min<sup>-1</sup> oxygen flow rate, OH = 6 mm. Measured points are displayed for clarity.

### 3.4 Interference study

Table S1 The interference from hydride forming elements (Sn, Pb, Sb, Se, As and Hg) on Bi determination ( $1 \mu\text{g L}^{-1}$ ) using FIGS and various interference filters

interferent	concentration of ( $\mu\text{g L}^{-1}$ )	recovery <sup>a</sup> (%)		
		202 nm filter	223 nm filter	307 nm filter
Sn	1	99	100	100
	10	100	100	102
	100	100	99	100
Pb	1	102	100	100
	10	101	99	101
	100	101	100	100
Sb	1	159	117	99
	10	738	288	100
	100	7427	2209	88
Se	1	101	101	99
	10	101	100	99
	100	102	100	99
As	1	99	100	99
	10	99	97	97
	100	66	73	69
Hg	1	101	100	101
	10	100	99	100
	100	99	99	99

<sup>a</sup>relative combined SD (combined SD/recovery) is < 3% for all recovery values