

"On spot" Collection of reactive Mercury

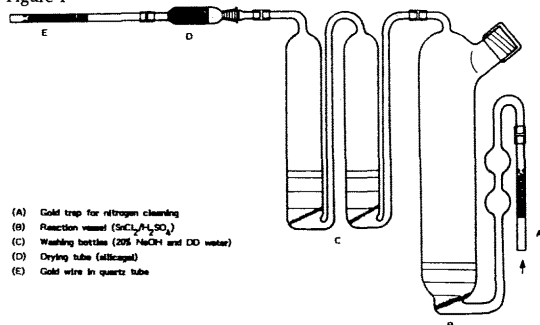
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A single device for the reduction of mercury from the samples and its collection in the elemental form onto gold wire is illustrated in Fig. 1.

Figure 1



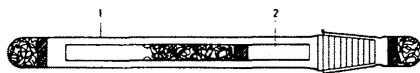
- (A) Gold trap for nitrogen cleaning
- (B) Reaction vessel ($\text{SnCl}_2/\text{H}_2\text{SO}_4$)
- (C) Washing bottles (20% NaOH and DD water)
- (D) Drying tube (silicagel)
- (E) Gold wire in quartz tube

A method has been applied on the vessel or on-shore within few minutes of sampling, taking into consideration wind direction and lee-side, respectively.

Water samples were taken into a reaction vessel containing a SnCl_2 and H_2SO_4 solution where mercury was isolated from the solution after reduction by SnCl_2 . The mercury was passed over gold wire using extra pure nitrogen as purging gas and sample carrier, and was subsequently amalgamated.

The gold wires with the deposited mercury were stored for several months in a well-protected, closed quartz vessel (Fig. 2), with no significant changes in mercury concentrations (Table 1). Measurements were performed using cold vapour atomic absorption spectrometry (CVAAS).

Figure 2.



- (1) Quartz vessel
- (2) Quartz tube with gold wire

The samples were collected (Sibenik Aquatorium, Adriatic Sea, Croatia) by a diver facing the current direction, thus practically excluding "classical" problems associated with the sampling procedure (1).

In the estuarine water layer of lower salinity the reactive/total mercury ratio was between 0.1 and 0.5, whereas in the estuarine water layer of higher salinity the ratio was between 0.8 and 1.0 as in "clean" coastal seawater (2,3).

Table 1. Reactive mercury concentrations after collection and storage on gold wire

Place of sampling	Date of sampling and collection of reactive Hg onto gold wire	Reactive Hg concentration (direct measurement) ng/l	Date of measurement of reactive Hg collected and storage onto gold wire	Reactive Hg concentration ng/l
Krka River Estuary (E) S=19‰	17.09.1990	0.55 (Total Hg 1.1)	19.09.1990 (2 days)	0.5±0.1 4
			28.09.1990 (11 days)	0.6±0.2 4
			04.12.1990 (77 days)	0.6±0.2 4
Zlarin Island outer side of coastal zone (C) S=37‰	22.09.1986	0.30 (Total Hg 0.32)	25.09.1986 (3 days)	0.31±0.05 4
			10.10.1986 (18 days)	0.25±0.05 4
			07.11.1986 (46 days)	0.28±0.03 4
			24.11.1986 (63 days)	0.20±0.02 4

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