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Author: Hamed Piri-Moghadam, Fardin Ahmadi, Janusz Pawliszyn

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1 A critical review of solid phase microextraction for analysis of water samples

2 Hamed Piri-Moghadam, Fardin Ahmadi, Janusz Pawliszyn*

3 Department of Chemistry, University of Waterloo, 200 University Avenue West, Waterloo, Ontario N2L 3G1, Canada

4 * Corresponding author: Tel. 519-888-4641, Fax. 519-746-0435, E-mail: janusz@uwaterloo.ca

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6 **Highlight:**

- 7 • Solid phase microextraction (SPME) for analysis of water samples
- 8 • Inter-laboratory validation of SPME and comparison with official methods
- 9 • Presentation of official methods of SPME including US EPA, ISO and ASTM
- 10 • On-site sampling and high-throughput 96-blade format as the new perspective of SPME
- 11 • Time weighted average sampling by retracted devices and open bed configurations

12 **Abstract**

13 The review summarizes applications of solid phase microextraction (SPME) for water sample
14 analysis. Official methods and standards of SPME in water research and inter-laboratory
15 validation are discussed. A comparison of SPME with current EPA-approved methods from
16 several analytical aspects is presented. The review also provides some perspectives of the recent
17 development of SPME on sampling water using artificial river systems, in the passive sampling
18 and on-site sampling. Recently developed configuration of SPME such as thin film
19 microextraction and high-throughput applications (*e.g.* when used in a 96-blade configuration)
20 are shown.

21 *Keywords:* Solid phase microextraction, water analysis, official and standard methods, inter-laboratory
22 studies, on-site sampling, time weighted average

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