Microwave Surface Wave Plasmas in coupling with hydride generation

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During the past two decades, the inductively coupled plasmas, ICPs, have been extensively used in spectrochemical analysis. Furthermore, since the production of volatile covalent hydrides from solutions has proved to be an effective means of analyte preconcentration and sample introduction, the continuous hydride generation technique has been established in direct coupling with ICPs. Attempts to interface hydride-generation systems with conventional microwave plasmas (MIPs) have found many difficulties, mainly because their susceptibility to perturbation by the hydrogen produced during the hydride-generation step. Only in the experiments carried out with a microwave plasma torch (MPT) [1], the hydrogen introduction was tolerated up to 30% (v/v). However, a low enough detection limit was not achieved.

Therefore, the aim of our study was the design of a simple system to be coupled to a 2.45 GHz surface wave discharge and allowing the plasma to support the volatile products generated by continuous hydride generation.

Surface wave discharges can be created with lower power and gas consumption. In this way, the designed system coupled to this plasma type could be considered as a possible alternative to ICP in order to detect elements able to form volatile covalent hydrides.

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References