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The measurement principles, working parameters and configurations of voltammetric electronic tongues and its applications for foodstuff analysis

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1 **Running title: A review of the development and application of VE-tongue**

2 **The measurement principles, working parameters and configurations of**
3 **voltammetric electronic tongues and its applications for foodstuff analysis**

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6 **Abstract:** Voltammetric electronic tongue (VE-tongue) is a promising technology for advanced sensing and
7 measurement applications. The review examines the measurement principles, working parameters and
8 configurations of different types of voltammetric electronic tongues (VE-tongue): the VE-tongue based on
9 bare electrodes, modified electrodes and biosensors. The working parameters of these VE-tongues (electrode
10 cleaning method, pulsed voltammetry and pre-processing of responses data) are described, and the
11 development of VE-tongue based on miniaturized sensors arrays and automatic flow techniques is also
12 presented. The applications of foodstuff analysis commented include recognition of basic tastes substances,
13 tracing origins/samples recognition, process monitoring, and quality investigation. Finally, the unsolved
14 problems and significant efforts of VE-tongues are depicted.

15 **Keywords:** Voltammetric electronic tongues; Foodstuff analysis; Metallic electrode; Modified electrode;
16 Biosensors; Pulsed voltammetry

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