



FLOW ANALYSIS XI

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***SEQUENTIAL INJECTION LAB-ON-VALVE SYSTEM FOR THE
DETERMINATION OF THE ACTIVITY OF PEROXIDASE IN
VEGETABLES***

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Peroxidase (E.C. 1.11.1.7) is an enzyme commonly found in vegetables that can be responsible for a negative effect on the colour and on the flavour of raw or processed food. Its activity is directly implicated in the enzymatic browning of the vegetables. To extend the shelf life of vegetables they can be submitted to a blanching process. This process is a thermal procedure designed to inactivate the enzymes responsible for the generation of off-flavours and off-odours. Since peroxidase appears to be the most heat stable enzyme in plants, the assessment of its remaining activity is widely used to evaluate the effectiveness of the food thermal blanching. It is generally accepted that, if the peroxidase originally present in the sample is destroyed, then it is quite unlikely that other enzyme systems have survived.

The determination of peroxidase activity has been described based on colorimetric, chemiluminescence, electrochemical or fluorimetric detection of the product formed from the peroxidase reducing substrate. In this work, a spectrophotometric detection of the peroxidase activity in vegetables extracts is described using a flow method with sequential injection lab-on-valve format. The system is based on the reaction between hydrogen peroxide (H_2O_2) and 2,2-azino-bis(3-ethylbenzothiazoline-6) sulphonic acid (ABTS) catalysed by the enzyme (HRP). The method presented a low sample consumption of 15 μL and low consumption of ABTS and H_2O_2 of 24 μg and 12 μg respectively, per assay. It was possible to achieve a linear range up to 2 mg/L with a throughput of 1 determination per minute, which corresponds to an increase on the determination rate of 50% comparatively to the comparison method. It was also possible to monitor the on-line thermal inactivation of peroxidase at different temperatures.

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