Determination of antioxidants in food using HPLC hyphenated to an optimized ABTS-radical scavenging assay

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Radical scavenging assays, which are one type of antioxidant testing procedures, have been used to measure the total antioxidant capacity of complex mixtures in an offline method. In the last decade the 2,2'-azino-bis(3-ethylbenzothiazoline)-6 sulfonic acid (ABTS) assay has increasingly been coupled to high performance liquid chromatography. The ABTS based assay is characterized by fast reaction kinetics, which allows miniaturization, thus far little emphasis has been set on preservation of the peak capacity achievable by HPLC in the post-column radical scavenging assay. In this work reaction time, buffer and reagent concentration, reactor dimensions and geometry, temperature and flow rates were therefore optimized for the ABTS assay to minimize the efficiency loss of the separation due to the residence time in the reactor. The optimized ABTS assay is tested with various mixtures of antioxidants in order to detect and identify antioxidants in red wine and deep frying oil