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Voltage Dependency in Coulometric Analysis of Tea Polyphenols and Isoflavones in Foodstuffs

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To establish an analytical method for phenolic compounds in foodstuffs and tissue samples, we determined five simple polyphenols, five tea polyphenols and five isoflavones using high performance liquid chromatography equipped with a coulometric array detector. When simple polyphenols were detected with eight coulometric array detectors at 350 to 700 mV, trihydroxyphenols gave the highest signal at 350 mV, *o*- and *p*-diphenols at 400 mV, and *m*-diphenol at 700 mV. In tea polyphenols with *m*-diphenolic A ring and di- or triphenolic B ring, strong signals were detected at 400 and 700 mV. In isoflavone aglycons having monophenolic or *m*-diphenolic A ring, monophenolic B ring, and C ring with 4-carbonyl group, a strong signal was observed at 500 or 550 mV and at 700 mV.

However, equol without 4-carbonyl group gave a single peak at 650 mV. These results suggest that the signal at 350–400 mV is due to the conjugated OH groups present in *o*- or *p*-derivative, the signal at 500–550 mV is due to the 4-carbonyl group and the signal at 700 mV to isolated OH groups present in monophenols or *m*-diphenols.

Keywords: [coulometric analysis](#), [tea polyphenols](#), [isoflavones](#)



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