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[Lab. of Pharm. Analytical Chemistry]

Reversed-Phase High-Performance Liquid-Chromatographic Behavior of Phthalic Acid and Terephthalic Acid in the pH Region around the Second pK_a Values.

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In a reversed-phase HPLC phthalic acid and terephthalic acid have been observed as being clearly splitted into two peaks with a mobile phase at the pHs around the second pK_a 's involving the monoanion and dianion species. Separation of the peak was observed in the presence of the monoanion and dianion species in almost equal quantities. The behaviors are sensitively affected by the percentage of organic solvents in the mobile phase. The two peaks appear due to a disturbance of the partition equilibrium at the very beginning of the separation. Further inspection of this model can give a wider applicability to a reversed phase HPLC system for ionic species.

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Superoxide Anion Radical-Induced Dioxygenolysis of Quercetin as a Mimic of Quercetinase.

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A direct single-electron transfer to superoxide anion radical (O_2^-) is widely believed to induce the O_2^- -dependent oxidation of flavonols. In this paper it has been elucidated that reaction of quercetin with superoxide anion radical is triggered by proton abstraction from quercetin to yield dismutated products of superoxide and deprotonated quercetin, which allows quercetinase-like dioxygenation to give the corresponding depside in a high yield.

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Enzyme Microelectrodes for Choline and Acetylcholine and Their Applications.

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Hydrogen peroxide based amperometric microsensors have been developed for choline (Ch) and acetylcholine (Ach) by coimmobilization of acetylcholinesterase (AchE) and choline oxidase (ChO) on platinum disk microelectrodes using glutaraldehyde vapor. The sensor was applied in micro flow injection and micro liquid chromatographic analyses. The chromatographic peak heights were linearly proportional to the amounts of Ach and Ch over the range of 0.05 to 10^3 pmol with correlation coefficients > 0.99 . Immobilization of ChO was used for the selective determination of Ch with a response time of 5 s. This electrode was used for activity measurements of AchE down to 0.25 U ml^{-1} in a $1 \mu\text{l}$ volume in a batch method at a total volume of 5.0 ml.