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Application Derivatization by Means Perhydrolysis Reactions in Pharmaceutical Analysis

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This article describes derivatization chemistry used in conjugation with either spectrophotometry, fluorimetry or voltammetry methods to facilitate the determination of pharmaceuticals. Generally, derivatization is used in spectrophotometry, kinetic spectrophotometry, voltammetry and fluorimetry, principally to enhance detectability. The section considers derivatization of drugs such as antibiotics (penicillins and cephalosporins), esters and peroxides. For spectrophotometry, fluorimetry and voltammetry sections, data are included giving the structures of the more important for derivatization agents, the analytes, and the corresponding reaction products. Derivatization for spectrophotometry, fluorimetry or voltammetric methods is often directed toward esters and amides that are difficult to detect at low levels by absorbance, luminescence, or electrochemical means. On the oxidation by means of peroxy acids or oxone and/or perhydrolysis reactions of drugs was the primary focus in this article.

The spectrophotometric, fluorimetric, voltammetric and kinetic methods can be easily applied for indirect determination by means of derivatization by peroxy acid oxidation and/or perhydrolysis (with peroxy acid oxidation before alkali hydrolysis) of the investigated drugs (penicillins and cephalosporins, alkaloids, esters and etc) in pure and dosage forms that do not require elaborate treatment and tedious extraction of chromophore produced. The proposed methods with use peroxy acid and oxone as derivative agents for obtain of derivatives is sensitive enough to enable determination of lower amounts of drug, these advantages encourage the application of proposed method in routine quality control of investigated drugs in industrial laboratories. Finally, method provides advantages of improving selectivity and accuracy, avoiding interference of colored and/or turbidity background of samples because it measures the increase in analytical signal (absorbencies, emission) with time against blank treated similarly and at strong dilution.

Keywords: derivatization, phenothiazine, antibiotics (penicillins and cephalosporins) spectrophotometry, fluorimetry, voltammetry, kinetic method, peroxy acid, oxone, perhydrolysis