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**Simultaneous Determination of Estrogens (Ethinylestradiol and Norgestimate)  
Concentrations in Human and Bovine Serum Albumin by Use of Fluorescence  
Spectroscopy and Multivariate Regression Analysis**

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**ABSTRACT**

The endocrine disruption property of estrogens necessitates the immediate need for effective monitoring and development of analytical protocols for their analyses in biological and human specimens. This study explores the first combined utility of a steady-state fluorescence spectroscopy and multivariate partial-least-square (PLS) regression analysis for the simultaneous determination of two estrogens (17 $\alpha$ -ethinylestradiol (EE) and norgestimate (NOR)) concentrations in bovine serum albumin (BSA) and human serum albumin (HSA) samples. The influence of EE and NOR concentrations and temperature on the emission spectra of EE-HSA, EE-BSA, NOR-HSA, and NOR-BSA complexes was also investigated. The binding of EE with HSA and BSA resulted in increase in emission characteristics of HSA and BSA and a significant blue spectra shift. In contrast, the interaction of NOR with HSA and BSA quenched the emission characteristics of HSA and BSA. The observed emission spectral shifts preclude the effective use of traditional univariate regression analysis of fluorescent data for the determination of EE and NOR concentrations in HSA and BSA samples. Multivariate partial-least-squares (PLS) regression analysis was utilized to correlate the changes in emission spectra with EE and NOR

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