

Highly Sensitive Time-resolved Fluorometric HPLC for Estrogens and 4-nonylphenol by Using a β -diketone Europium Chelate

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The development of a highly sensitive method for estrogens and 4-nonylphenol has been investigated, oriented to the environmental samples, using europium Chelate derivatization HPLC and a time-resolved fluorescence detector. The system was constituted from the prederivatization of phenolic hydroxyl group with a europium chelate fluorescent labeling agent (CDPP), and the labeled phenolic compounds were separated isocratically on RP-HPLC column. After separation, the postcolumn reagent containing europium chloride, tri-n-octylphosphine oxide, and Triton X-100 were introduced to the eluent, and resulted fluorescence was estimated with the time-resolved phosphorescence detector (TRPD). The detection limits for estrogens and 4-nonylphenol were 3.6 pg and 8.8 pg per injection volume, respectively. For the phenolic compounds in the river water samples, the pretreatment procedure was devised with solid-phase extraction using Sep-Pak cartridges. The average recoveries from river water samples were 86.0 to 105.1 % for estrogens and 64.8 % for 4-nonylphenol. The precision of the method ranged from 2.5 to 5.9 %. Using this method, the concentrations of estrogen (estrone) and 4-nonylphenol in a river water were 2.1 ng/L and 4.8 ng/L, respectively.