EuroSciCon

10th Edition of International Conference on

Analytical Chemistry

February 28-March 01, 2019
London, UK

Insights Anal Electrochem 2019, Volume 5
DOI: 10.21767/2470-9867-C1-009

RP-HPLC biopharmaceutical analytical methods of binary and ternary mixtures used in the treatment of cardiovascular disorders

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Bioanalytical methods employed for the quantitative determination of drugs in biological samples, play a significant role in the evaluation of serum drugs concentration. Thus, selective and sensitive analytical methods for quantitative evaluation of drugs in biological fluids are of such importance. In the preset work RP-HPLC methods have been developed and validated for the simultaneous estimation of cardiovascular binary and ternary mixtures consisting of clopidogrel-rosuvastatin and ticagrelor-irbesartan-hydrochlorothiazide. The proposed combinations were determined in laboratory prepared mixtures, spiked rat plasma and rat plasma samples. Moreover, pitavastatin and candesartan binary mixture has been determined in laboratory prepared mixtures, spiked human plasma and human plasma sample. The chromatographic analysis was performed at ambient temperature with isocratic elution using C18 column at a flow rate of 1 mL/min. A mobile phase composition of acetonitrile: phosphate buffer (70:30, %v/v) at pH 2.6 was found to provide optimum separation for clopidogrel-rosuvastatin, pitavastatin-candesaratan binary mixtures where the detection wavelength used was 220 and 238 nm, respectively. However, a mobile phase composition of acetonitrile: phosphate buffer (60:40, %v/v)) at pH 3.6 was found to provide optimum separation for ticagrelor, irbesartan and hydrochlorothiazide ternary mixture, where the detection wavelength used was 230 nm. The proposed methods were validated as per ICH guidelines. The low LOD and LOQ values enabled the successful determination of the target drugs in clinical samples.

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