Naflaa Aldawsari, J Chromatogr Sep Tech 2021, Volume 12

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A Simple and Reliable HPLC Method for Simultaneous Separation and Quantification of Benzodiazepine Drugs in Biological and Environmental

Benzodiazepines (BZDs) are one of the most important drugs which have been used in the treatment of neuropsychological disorders. In the current work, a simple and reliable reversed phase high performance liquid chromatography (RP-HPLC) method was developed for the simultaneous separation and determination of five benzodiazepines (Bromazepam, Clonazepam, Lorazepam, Nordiazepam, and Diazepam). Isocratic elution on a C18 column (150 × 4.6 mm, 5 µm) with a mobile phase consisting of 0.2 mM phosphate buffer pH 7.0: methanol (50:50 v/v) at a flow rate 1.0 mL min^{-1} has been performed. The column eluent was monitored with a UV detector at 214 nm and the column temperature was fixed at 40° C . The proposed method was validated according to the International Conference on Harmonization (ICH) guidelines. Calibration curves were linear within the wide range of 10-50 µg/mL for all drugs, with a determination coefficient (R^2) rang between 0.992- 0.990. The Limit of detections (LODs) of all drugs were ranged between 10.539 and 2.319 µg mL^{-1} respectively, and the limit of quantifications (LOQs) were ranged between 1.779 and 7.652 µg mL^{-1} respectively. Precision and accuracy ranges were found to be between % RSD < 0.011 and 90.349 % to 107.064 %, respectively. Based on these results, a simple analysis procedure was successfully applied to determine benzodiazepines in biological and environmental samples.

Biography

Naflaa Aldawsari currently working as Professor at King Abdulaziz University, Jeddah, Saudi Arabia. She received Bachelor's degree from Chemistry at Abdulaziz University, Jeddah, Kingdom of Saudi Arabia in 1996. In 2004 completed Master's degree from Chemistry, Science, University of Newcastle, Newcastle, UK. In 2008 received Doctorate degree from Chemistry, Science, Loughborough University - Britain, Loughborough, UK.