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Chromatographic columns for HPLC: An overview of today's technology and their applications for analysis of some pharmaceutical products in drug quality control laboratories

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It is true that, the possibilities of HPLC continually being extended through the development in HPLC-column technology, advances in instrumentation design and performance. The HPLC column is the heart of the HPLC – instrument and essential to its success. Today's HPLC column technology offering high efficiency, high resolution, short analysis time, use of minute volumes and a wide pH range of mobile phase. Drug analysis in drug quality control laboratories of Kuwait have been benefited from these advanced features of today's HPLC column technology considering the main advantages over conventional HPLC columns. This will be done by reporting some of our recent results obtained by using these columns (Symmetry, Symmetry Shield and XTerra columns) for analysis of some pharmaceutical preparation according to the requirements of drug manufacturer's specification or drugs pharmacopeias. Determination of molecular size distribution as a quality control test for human albumin in pharmaceutical preparations was done using size exclusion (SE) columns. HPLC – column for mass spectrometry was employed as analytical column (C18, 150 mm X 2.1 mm and 5 um particle size, Symmetry 300 Waters, Milford, MA, USA) for screening studies which was conducted to investigate the presence of three synthetic PDE-5-inhibitors, Sildenafil (S), Tadalafil (T) and Vardenafil (V) illegally adulterated in natural herbal products. These herbal products have been a subject for registration by Kuwait Drug and Food Quality Control Administration (KUFDA) as a natural herbal product for improving sexual performance for man in the period from 2003 to 2012. Analytes detection was done simultaneously by PDA and MS. Nowadays in our laboratories, instead of atomic absorption spectroscopy (AAS), HPLC with conductivity detector and cation or anion columns were employed for analysis of cations such as, Na+, K+ , Mg++, Ca++ in balance salt solution (BSS) and anions such as Cl-- in Movicol sachets (for the relief of constipation). Based on ion exclusion chromatographic mechanism (polymethacrylate – based weak acidic cation exchange resin HPLC column) with detection UV, a simple, selective and sensitive method for the determination of carboxylic acids in renal dialysis solutions was used in our laboratories. Finally and on the base of our results, it can be said that using today's column technology by the analyst in drug quality control laboratories will be valuable for increasing their lab productivity and accuracy.

Biography

Moustafa A Khalifa has completed his PhD in Chemistry (Pesticides Chemistry) from the Institute of Industrial Organic Chemistry, Academy of Science, Warsaw, Poland (1982). He is a Lab Consultant for Drug and Food Quality Control Laboratories, Ministry of Health, Kuwait and has been serving as a Professor of Pesticides Chemistry and Analysis (1992 till now) at Kafer Elsheikh University, Egypt.

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