



B78 Chiral Analysis of Methorphan and Citalopram Using HPLC

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After attending this presentation, attendees will have a better appreciation for the chiral separation by HPLC using vancomycin columns.

This presentation will impact the forensic science community by serving as a key aspect in describing a new method for analyzing methorphan and citalopram stereoisomers in forensic drug and toxicology specimens using vancomycin columns by HPLC.

The analysis of drug and toxicology evidence makes up an enormous part of the caseload in the New Jersey State Police laboratory system. State-of-the-art instrumentation and a qualified staff are essential components for analyzing and identifying the wide variety of controlled and non-controlled substances seen in drug casework. Although established methods exist for the analysis of most drugs, some drugs, such as methorphan and citalopram because of their chiral nature, still present problems for analysis.

Chiral compounds are optically active compounds that exist in two isomeric forms. The optical isomers are mirror images of each other as a result of the tetrahedral arrangement around the chiral center, usually a carbon atom. One of the biggest problems with analyzing and identifying chiral compounds using HPLC, or any other chromatographic method, is effectively resolving the enantiomers. Before the mid-1980s and early 1990s, the routine separation of stereoisomers was difficult. Over the last 20 years the development of chiral columns has allowed analysts to resolve many chiral analytes, however not always with optimal efficiency or selectivity. Until around 1994, most chiral columns were made using cyclodextrin stationary phases. At that time another class of chiral selectors for liquid chromatography made up of macrocyclic antibiotics was developed showing a greater range of success than the traditional cyclodextrin phases.

Recently, a research study by the Finland National Bureau of Investigation and the University of Helsinki effectively used a macrocyclic antibiotic phase column based on vancomycin to perform chiral separations of numerous drugs, including methorphan. That research, done in 2004, appears to be the first time vancomycin columns for HPLC have been used for the separation of methorphan isomers. In addition, it appears the HPLC procedure has not been widely recognized in forensic drug laboratories in this country. Like methorphan, there have been few examples of enantioseparation of citalopram in chromatography literature. However, there were some successful pharmaceutical studies which achieved chiral separation of citalopram and its metabolites in plasma samples using HPLC with the same vancomycin column mentioned above.

Unfortunately, there is no published data concerning the use of this column for both methorphan and citalopram chiral separations in forensic drug and toxicology samples. It was the purpose of this study to produce a method for analyzing methorphan and citalopram based on these studies and apply it to forensic drug and toxicology samples. Several forensic drug and toxicology specimens were collected and analyzed using this HPLC method and with successful results in many of these cases.

Chiral Analysis, HPLC, Citalopram