

Solid Phase Extraction of Abused Drugs from Urine^a

REFERENCE: Platoff GE Jr, Gere JA: Solid phase extraction of abused drugs from urine; *Forensic Sci Rev* 3:117–133; 1991.

ABSTRACT: The current standard for acceptable practice in forensic urine drug testing, as reflected in both National Institute for Drug Abuse (NIDA) and military guidelines, requires an initial immunoassay followed by gas chromatography/mass spectrometry (GC/MS) confirmation. The GC/MS confirmatory procedures mandate extraction of the drug from the urine matrix, followed in most cases by chemical derivatization, prior to injection into the gas chromatograph. Classically, the extraction step has been accomplished using liquid-liquid techniques, but in recent years, the use of solid phase chromatographic techniques has become increasingly popular. Numerous companies now market solid phase columns that are designed specifically for extraction of drugs, some of them containing as many as three different components for extracting acidic, basic, and neutral drugs. A survey of NIDA laboratories, conducted specifically for this review article, revealed that 40 to 50% of the extraction procedures currently performed involved the use of solid phase cartridges. This article reviews chromatographic separation techniques in general, specific products that are currently available on the market, the performance of those products, and examines the results of the survey of NIDA-certified laboratories.

KEY WORDS: chromatography, drugs of abuse, drug testing, extraction, NIDA, solid phase, solid phase extraction, urine.