

Solid-Phase Extraction for Systematic Toxicological Analysis

REFERENCE: Chen X-H, Franke J-P, de Zeeuw RA: Solid-phase extraction for systematic toxicological analysis; *Forensic Sci Rev* 4:147-159; 1992.

ABSTRACT: This paper concerns the application of solid-phase extraction (SPE) of biological matrices for drug-screening purposes and considers both theoretical and practical aspects. An SPE procedure involves two parts: sample pretreatment and column extraction. According to the properties of biological specimens, sample pretreatment methods may vary. The common pretreatment method for plasma, serum, and urine samples is dilution. For whole blood, the combination of sonication and dilution is the best choice. Tissues can be treated by either protein precipitation or enzymic digestion. When the requisite substances are present in a conjugated form, deconjugation is required. In order to obtain acceptable results, one should understand the principles of SPE technology. Since many factors (such as the properties of sorbents, wash solvents and eluents, pH of sample and column system, and flow rates of samples and eluents passing through the column) may influence the final results, each step of SPE procedure should be optimized very carefully. Several reported SPE procedures for drug screening are summarized. Finally, new developments in SPE materials and methodology are addressed as well as the trends of automation of SPE for drug screening.

KEY WORDS: Biological samples, drug screening, sample preparation, solid-phase extraction, systematic toxicological analysis.