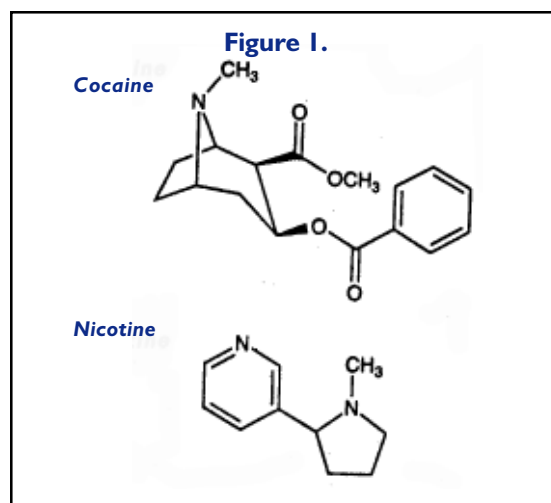


Low Detectability of Cocaine and Nicotine with SMT-QuickSep Column

The development of better analytical methods have always been the key to effective detectability of low concentration of organic compounds. Ability to detect and isolate low concentration of analytes is not only crucial for a healthy environment, it can also offer a tremendous enhancement to forensic applications. Drugs, such as, cocaine (Figure 1) prescribed as a local anesthetic in medicinal application are often abused by humans. Cocaine and its derivatives are controlled substances listed in the U.S. code of Federal Regulations, 1995, Title 21 Parts 329.1 and 1308.12. Nicotine (Figure 1) is found in dry leaves of *Nicotiana tabacum* and *N. rustica* where it occurs to the extent of 2 to 8%, combined with citric and malic acids. Commercial nicotine is entirely a byproduct of the tobacco industry.

Cocaine and Nicotine are basic organic compounds and their separation by HPLC technique can be very challenging. The difficulties in separation can be associated to their electrostatic interaction with the surfaces of the separation medium. The problem can be quite pervasive at low concentration levels, where high throughput is desirable for accurate quantitation. Most conventional C18 columns have high concentration of residual silanols that can interact with these molecules. The resulting chromatograms show tailing, low throughput, and carryover from one run to another.

SMT-QuickSep C18 column has shown an outstanding performance in the separation of cocaine and nicotine, with minimum detection limit of one picogram, using simple organic mobile phase. Figure 2 shows the chromatograms and a plot of the area counts for the two compounds as a function of concentration.



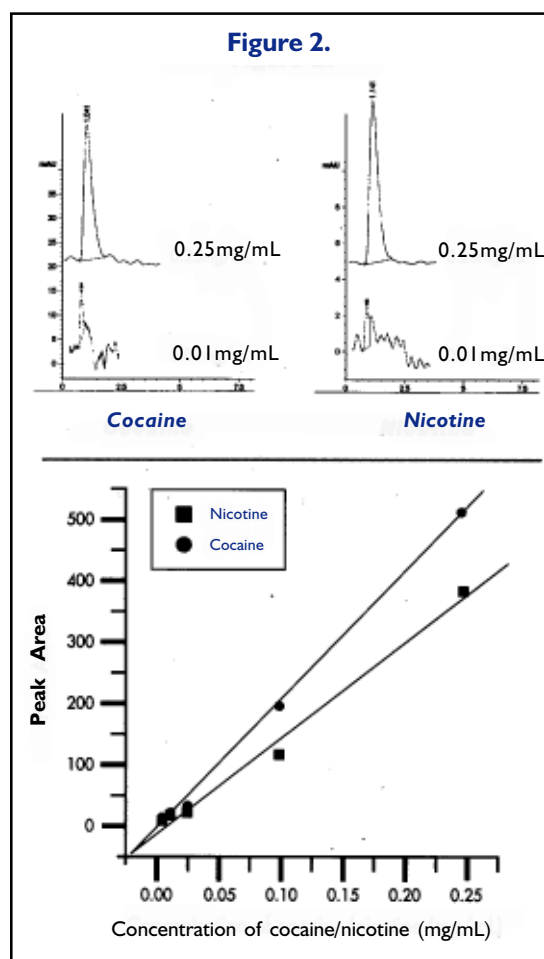
Chromatographic Conditions (Figure 2)

Column: SMT QuickSep 1/23
Mobile Phase: MeOH/water 85:15
Flow: 1mL/min
Inj: 20mL
Detector: UV, 235 and 260nm

Column Specifications:

Particle: Silica, 3 μm
Pore Size: 120 \AA
Surface Area: 170 m^2/g
% Carbon: 14%
pH range: 1-12

**SEPARATION
METHODS
TECHNOLOGIES**



*SMT wishes to thank Dr. Fang Ma of Rutgers University, Dept. of Psychology, for the donation of the cocaine and nicotine samples.

