Sensitive GC/MS Analysis for Drugs of Abuse

1ng Limit of Detection for Acidic/Neutral or Basic Drugs on New Rxi®-5ms Column

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- New stationary phase, inert to acidic or basic drugs.
- Unique deactivation allows 1ng LOD.
- Column technology specially developed for GC/MS.

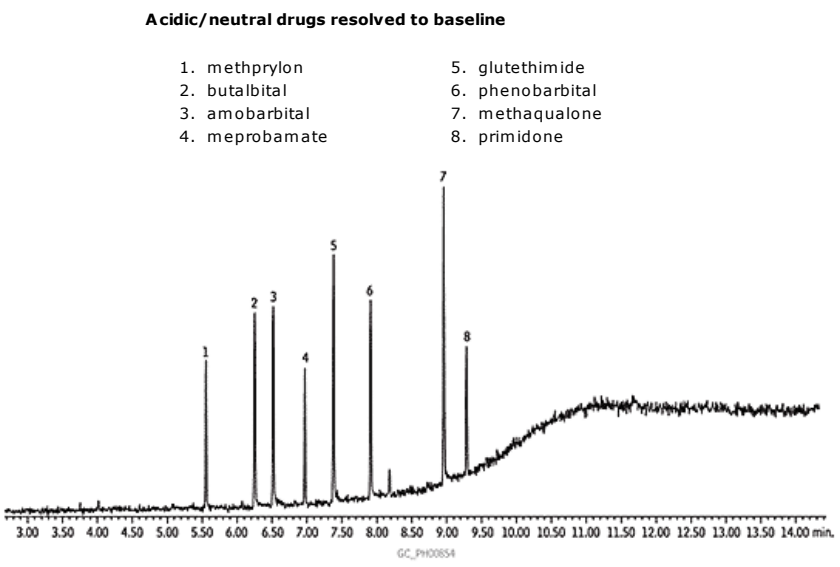
GC/MS is considered the standard for confirming the presence of abused drugs in body fluids, including acidic drugs (e.g., methaqualone), neutral drugs (e.g., phenobarbital), and basic drugs (e.g., methamphetamine). These methods are well established, and the positive identifications that mass spectral data generate are accepted as confirming evidence in courts of law. The accepted stationary phase for these analyses is a 5% phenyl / 95% methyl polysiloxane phase, because it provides the best selectivity for separating the drugs and their metabolites. Unfortunately, not all 5% phenyl columns provide the inertness needed to accurately quantify low concentrations of reactive acidic or basic drugs.

Now, Restek's R&D chemists have developed a new 5% phenyl stationary phase and a unique column deactivation technology specifically for GC/MS. The product of this combination - the Rxi®-5ms column - ensures enhanced inertness for acidic or basic compounds, while maintaining the selectivity of a conventional 5% phenyl column.

Using mixtures of underivatized acidic/neutral drugs and basic drugs, at an on-column concentration of 1ng for each drug, we evaluated a 30m, 0.25mm ID, 0.25µm Rxi®-5ms column for resolution and inertness. Figure 1 shows chromatography for acidic/neutral drugs and basic drugs analyzed by GC/MS. In either analysis, all compounds are resolved to baseline and exhibit symmetric peaks. Note that a Siltek® treated inlet liner contributes to these results: our unique Siltek® surface passivation process assures the liner will have the inertness needed for accurate low-level analyses of reactive acids or bases.

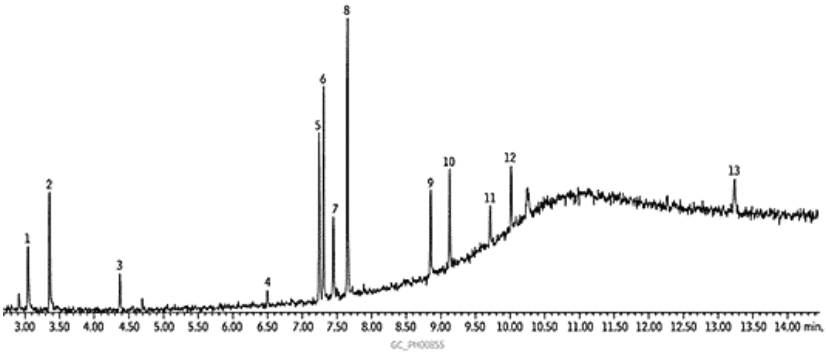
In combination, an Rxi®-5ms column and a Siltek® treated inlet liner represent a complete solution for analyzing acidic, neutral, and basic drugs by GC/MS.

Figure 1 Analyze underivatized acidic drugs or basic drugs under the same conditions, using an Rxi®-5ms column.



Sensitive analysis for basic drugs in free base form

1. amphetamine
2. methamphetamine
3. nicotine
4. cotinine
5. caffeine
6. benzphetamine
7. ketamine
8. phencyclidine
9. methadone
10. cocaine
11. scopolamine
12. codeine
13. alprazolam



Column:	Rxi®-5ms 30m, 0.25mm ID, 0.25µm (cat.# 13423)
Sample:	10µg/mL each acidic/neutral and basic drugs in methanol 1.0µL split (10:1), 1ng each compound on column;
Inj.:	Siltek® treated 4mm single gooseneck inlet liner (cat # 20798-214.1)
Inj. temp.:	250°C
Carrier gas:	helium, constant pressure
Flow rate:	1mL/min.
Oven temp.:	100°C to 300°C @ 20°C/min. (hold 5 min.)
Det.:	MS
Transfer line temp.:	300°C
Scan range:	35-550 amu
Ionization:	EI
Mode:	scan

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underivatized, *acidic drugs*, *basic drugs*, *Rxi-5ms*