



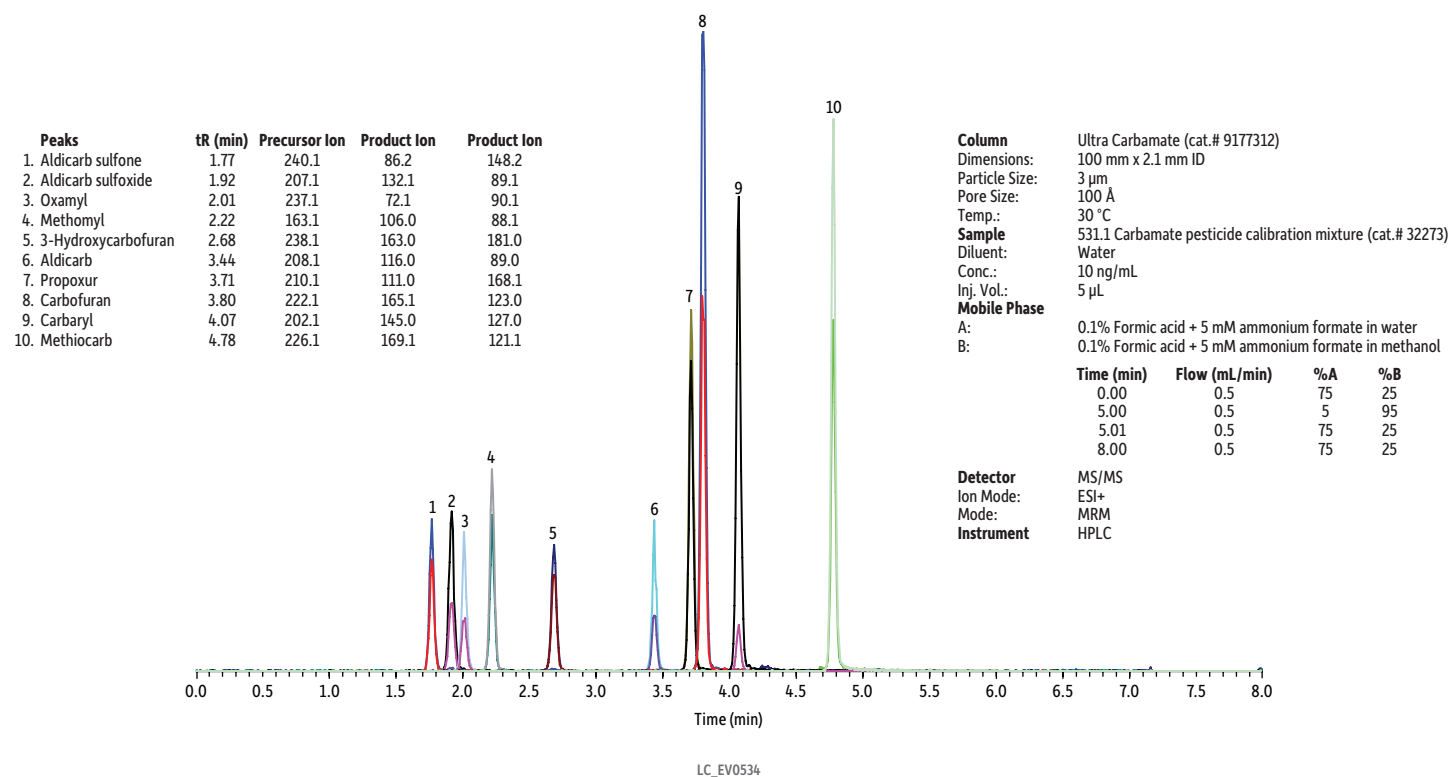
## Featured Application: Carbamate Pesticides on an Ultra Carbamate LC Column

# Analyze Carbamate Pesticides in a Fraction of the Time and Boost Productivity

- Ultra Carbamate LC columns equip you to analyze more samples per shift.
- Separate target carbamates in just 5 minutes with a total cycle time of 8 minutes by LC-MS/MS or LC-UV.
- Pair with convenient and reliable Restek certified reference materials for accurate, precise results.

Carbamate pesticides are widely used insecticides that pose human and environmental health risks due to their activity as endocrine disruptors. While many pesticides can be analyzed successfully using GC, carbamate pesticides are thermally unstable and degrade quickly in the hot GC inlet. Therefore, LC methods must be used to monitor levels of these semivolatile compounds in soil and water samples. C18 columns can be used for carbamate pesticides analysis, but traditional methods—such as EPA Method 531—require analysis times of over 20 minutes.

Using an Ultra Carbamate column instead of a C18 is a much better approach as this column was developed specifically for carbamates and allows much faster analysis times. The column has a unique selectivity and is compatible with UV, fluorescence, or LC-MS detection. As shown below, commonly monitored carbamate pesticides can be separated in less than 5 minutes (8 minutes total cycle time) using LC-MS/MS and a 100 mm x 2.1 mm Ultra Carbamate column. Alternatively, LC-UV detection at 220 nm may be used. Using an Ultra Carbamate column provides much faster analysis times than are typically achieved using a C18 column, which allows more samples to be analyzed per shift. In addition to increased sample throughput, this analysis will significantly reduce solvent usage—and the costs of disposing of solvent waste.





## Ultra Carbamate Columns

### Column Characteristics:

Particle Size: 3 µm or 5 µm, spherical

Pore Size: 100 Å

pH Range: 2.5 to 8

Temperature Limit: 80 °C

Description	cat. #
<b>3 µm Columns</b>	
100 mm, 2.1 mm ID	9177312

## Ultra Carbamate Guard Cartridges

Guard Cartridges	3-pk. (10 x 2.1 mm)
Ultra Carbamate Guard Cartridge	917750212

## Carbamate Reference Standards

Browse our selection of certified reference standards for carbamate analysis.

### 531.1 Internal Standard

(4-Bromo-3,5-dimethylphenyl-N-methylcarbamate (BDMC))

4-Bromo-3,5-dimethylphenyl-N-methylcarbamate (BDMC) (672-99-1)

100 µg/mL in methanol, 1 mL/ampul cat.# 32274 (ea.)

### 531.1 Performance Check Mix (4 components)

Aldicarb sulfoxide (1646-87-3), 100 µg/mL

BDMC (672-99-1), 10 µg/mL

3-Hydroxycarbofuran (16655-82-6), 2 µg/mL

Methiocarb (2032-65-7), 20 µg/mL

In methanol, 1 mL/ampul cat.# 32275 (ea.)

### 531.1 Carbamate Pesticide Calibration Mixture (10 components)

Aldicarb (116-06-3)

Aldicarb sulfone (1646-88-4)

Aldicarb sulfoxide (1646-87-3)

Carbaryl (Sevin) (63-25-2)

Carbofuran (1563-66-2)

3-Hydroxycarbofuran (16655-82-6)

Methiocarb (2032-65-7)

Methomyl (16752-77-5)

Oxamyl (23135-22-0)

Propoxur (Baygon) (114-26-1)

100 µg/mL each in methanol, 1 mL/ampul cat.# 32273 (ea.)

### 531.2 Carbamate Pesticide Calibration Mixture (11 components)

- Complete set of materials for N-methylcarbamoyloximes and N-methylcarbamates.
- New mix satisfies latest update of EPA Method 531.2.
- Formulated in acetonitrile for stability and convenience for LC analysis.

Because carbamates, especially aldicarb sulfone, are unstable, carbamate analyses usually are HPLC based. The U.S. EPA method for monitoring these compounds in drinking water, Method 531, calls for HPLC with post-column derivatization. 1-Naphthol, a fluorescent metabolite of carbaryl, was added to the analyte list in 2003. Our 531.2 Carbamate Pesticides Calibration Mixture includes 1-naphthol. For stability, we formulate the mix in acetonitrile.

Aldicarb (116-06-3)

Aldicarb sulfone (1646-88-4)

Aldicarb sulfoxide (1646-87-3)

Carbaryl (Sevin) (63-25-2)

Carbofuran (1563-66-2)

3-Hydroxycarbofuran (16655-82-6)

Methiocarb (2032-65-7)

Methomyl (16752-77-5)

1-Naphthol (90-15-3)

Oxamyl (23135-22-0)

Propoxur (Baygon) (114-26-1)

100 µg/mL in acetonitrile, 1 mL/ampul

cat.# 32435 (ea.)