

# Complete Resolution of 13 Carbonyls as DNPH Derivatives

## Using the New Allure® AK HPLC Column

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- Superior separation of difficult carbonyls—including butyraldehyde and methyl ethyl ketone—compared to C18 columns.
- Allows the use of a simple water:acetonitrile mobile phase for easier preparation and waste disposal.
- Significantly faster run time than conventional C18 columns—less than 12 minutes.

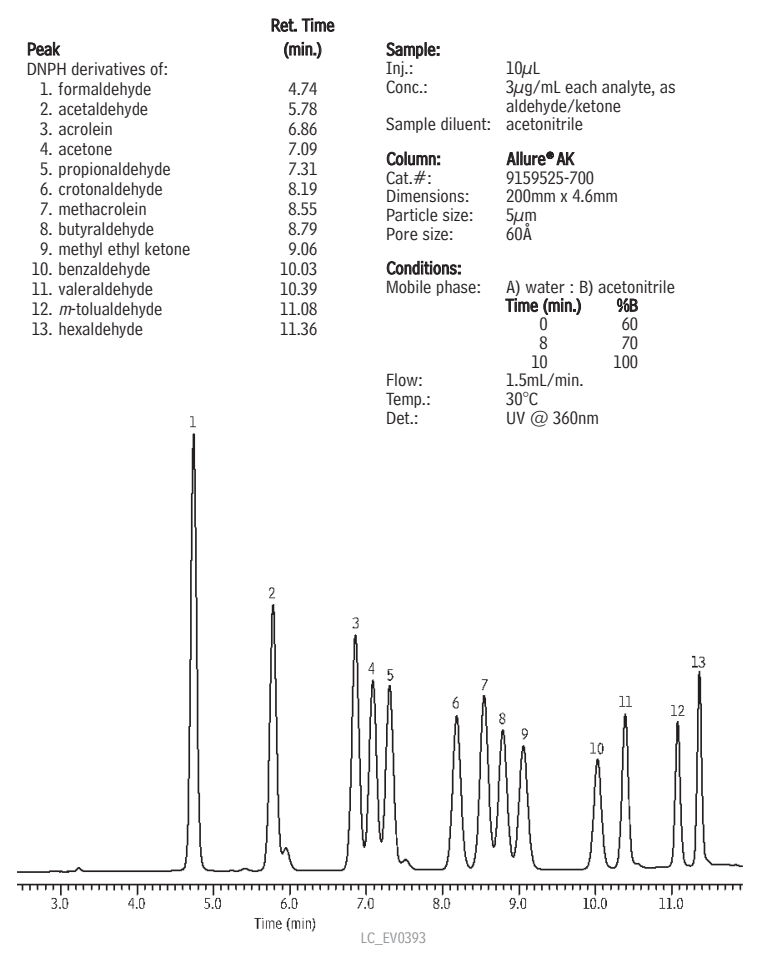
Carbonyls are collected and measured from a variety of samples, including air, exhaust, and cigarette smoke. For example, the California Air Resources Board (CARB) was established in 1967 to address many aspects of air pollution, including air quality problems caused by motor vehicles. CARB Method 1004 is used by the automotive industry to monitor a range of carbonyl compounds (e.g., aldehydes and ketones) in engine exhaust.

Sample collection cartridges impregnated with 2,4-dinitrophenylhydrazine (DNPH), or impingers containing acidified DNPH, are used to sample air or exhaust. After conversion to DNPH derivatives, the carbonyl compounds are collected and analyzed by HPLC. Since the DNPH derivatives absorb strongly at 360nm, detection limits below 1ppm are easily achievable. The original CARB method uses two C18 columns in series for analysis, although other columns can be used as long as they provide an equivalent or better separation.

The new Allure® AK HPLC column was developed specifically for the analysis of aldehydes and ketones. With a single 200mm column, excellent resolution of these compounds can be achieved in less than 12 minutes (Figure 1). While C18 phases often cannot separate butyraldehyde and methyl ethyl ketone (MEK), the Allure® AK column shows excellent resolution of this difficult pair. In addition, a simple mobile phase gradient of water:acetonitrile can be used with the Allure® AK column, while C18 phases require the addition of THF to achieve acceptable resolution.

When analyzing aldehydes and ketones by HPLC, such as the carbonyls specified in CARB method 1004, the new Allure® AK column will give you the resolution and fast analysis times that you require.

**Figure 1** Excellent resolution of carbonyl compounds in less than 12 minutes, using the Allure® AK HPLC column and a simple water:acetonitrile mobile phase gradient.



### CARB 1004 Aldehyde/Ketone-DNPH Calibration

#### Standard (13 components)

acetaldehyde-2,4-DNPH	hexaldehyde-2,4-DNPH
acetone-2,4-DNPH	methacrolein-2,4-DNPH
acrolein-2,4-DNPH	methyl ethyl ketone-2,4-DNPH
benzaldehyde-2,4-DNPH	propionaldehyde-2,4-DNPH
<i>n</i> -butyraldehyde-2,4-DNPH	<i>m</i> -tolualdehyde-2,4-DNPH
crotonaldehyde-2,4-DNPH	valeraldehyde-2,4-DNPH
formaldehyde-2,4-DNPH	

3µg/mL each in acetonitrile, 1mL/ampul  
cat. # 33093

### Allure® AK Columns

#### Physical Characteristics:

particle size: 5µm  
pore size: 60Å

endcap: yes  
pH range: 2.5 to 7.5  
temperature limit: 80°C

#### cat. #

5µm Column, 3.2mm, 200mm (with Trident Inlet Fitting)	9159523-700
5µm Column, 4.6mm, 200mm (with Trident Inlet Fitting)	9159525-700

Guard Cartridge	qty.	cat. #
10 x 4.0mm	3-pk.	915950210