

# APPLICATIONS

## Fast Analysis of Alcohol-Based Sanitizers by GC-FID using Zebron™ ZB-WAXPLUS™ GC Columns

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### Overview

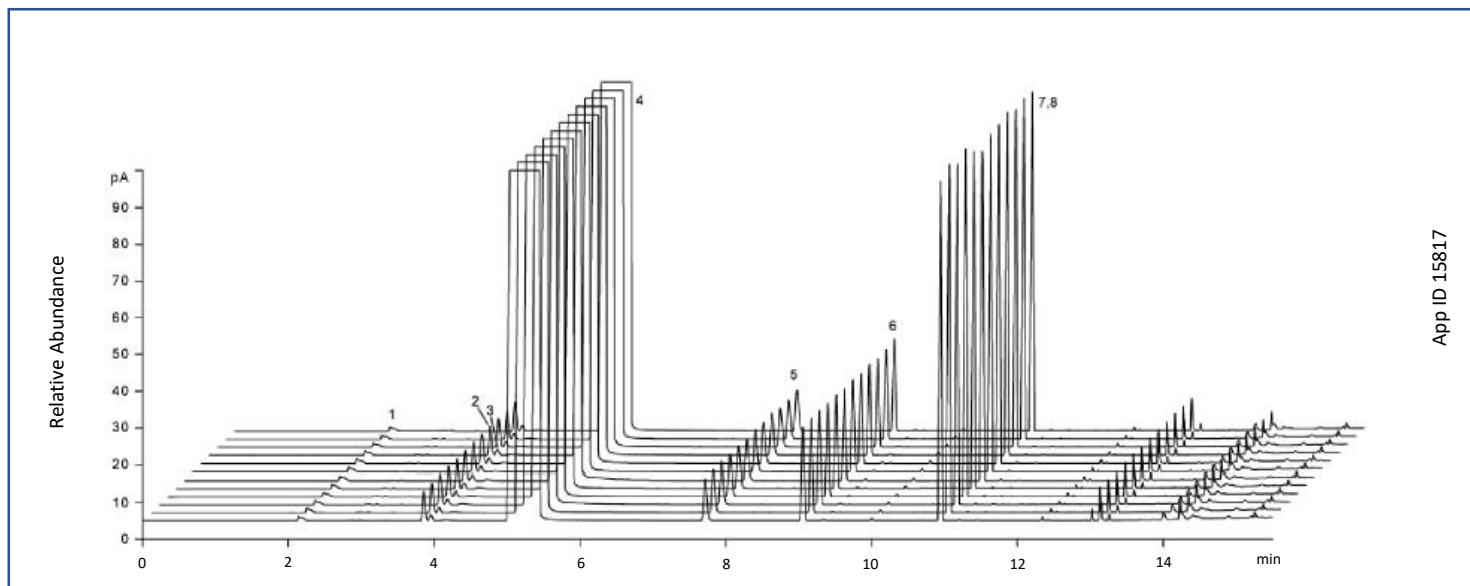
Hand sanitizer consumer products typically come in the form of liquid or gel and are thought to be generally effective at killing microorganisms and decreasing infectious agents on our hands. Alcohol-based sanitizers are most common, with versions that contain 60% to 95% alcohol. These versions typically contain some combination of isopropyl alcohol, ethanol (ethyl alcohol), and/or n-propanol.

Presented in **Figure 1** is the separation of alcohols commonly tested for in alcohol-based sanitizers including methanol, ethanol, propanol and butanol, on a 100% aqueous stable ZB-WAXPLUS GC column. In addition to the fast 15-minute separation, high injection-to-injection reproducibility can be noticed for this challenging aqueous matrix. This high-throughput separation example employed a high percentage ethanol to mimic alcohol-based sanitizer. **Figure 2** represents separation of trihydric alcohols, such as glycerols, that are added as moisturizer in some versions of hand sanitizers. A run time of less than 15 minutes is extremely helpful for faster testing and expedited batch release based on the GC test results.

### GC-FID Conditions

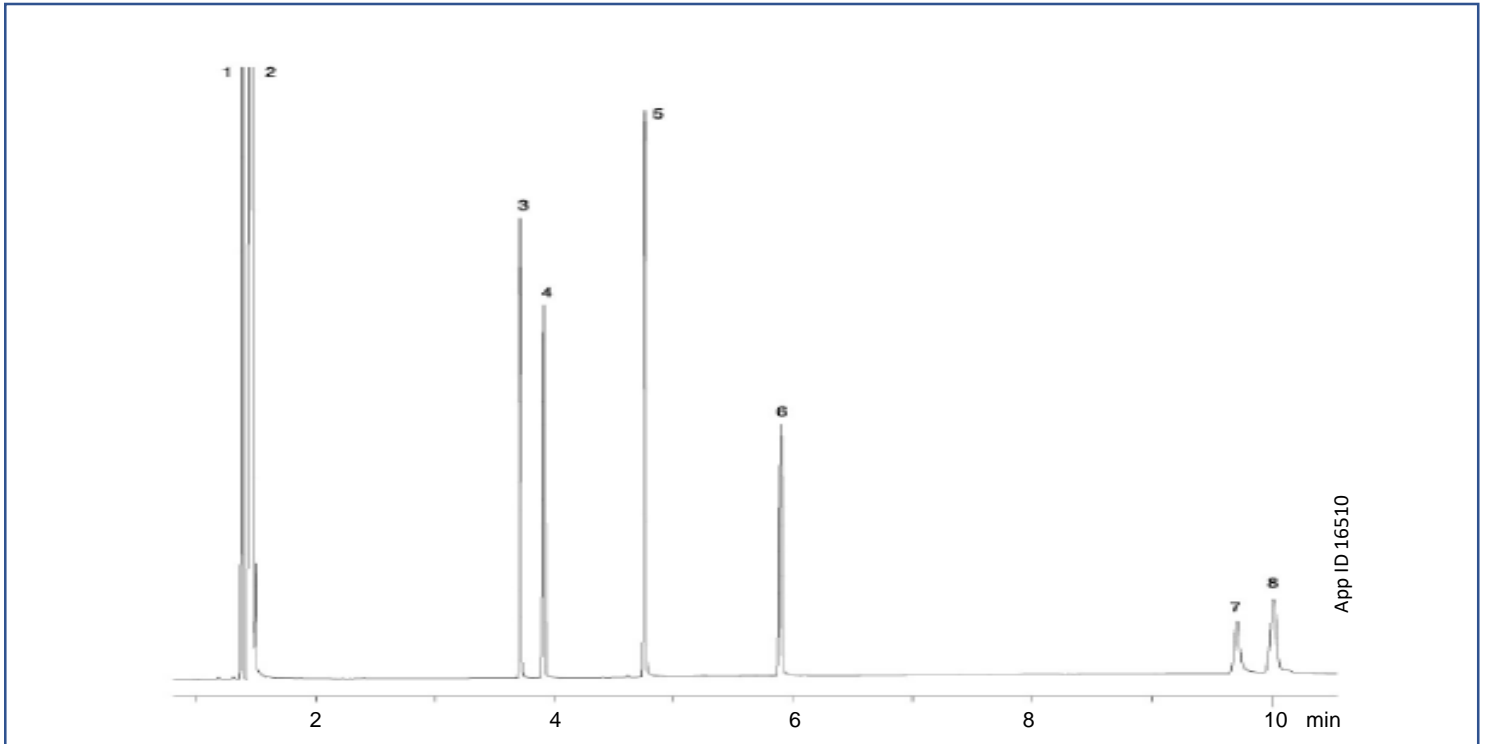
- Column:** Zebron ZB-WAXPLUS
- Dimension:** 30 meter x 0.25 mm x 0.25  $\mu$ m
- Part No.:** [7HG-G013-11](#)
- Injection:** 30:1 @ 140 °C, 0.2  $\mu$ L
- Recommended Liner:** Zebron PLUS Single Taper Z-Liner™
- Liner Part No.:** [AG2-4B13-05](#); [AG2-0A13-05](#)
- Carrier Gas:** Helium @ 1.4 mL/min (constant flow)
- Oven Program:** 35°C for 5 min to 85°C @ 10°C/min to 200°C @ 25°C/min for 1 min
- Detector:** Flame Ionization (FID) @ 200 °C
- Sample:**
  1. Acetaldehyde
  2. Ethyl acetate
  3. Methanol
  4. Ethanol
  5. Propanol
  6. Isobutanol
  7. 2-Methylbutanol
  8. 3-Methylbutanol

**Figure 1: Separation of Alcohols in Aqueous Matrix in Less than 15 Minutes on a Zebron ZB-WAXPLUS GC Column**



App ID 15817

**Figure 2: Separation of Glycerol in Less Than 11 Minutes on a Zebron ZB-WAXPLUS GC Column**




### GC-FID Conditions

- Column:** Zebron ZB-WAXPLUS  
**Dimension:** 30 meter x 0.25 mm x 0.25  $\mu$ m  
**Part No.:** [7HG-G013-11](#)  
**Injection:** Split 20:1 @ 225  $^{\circ}$ C, 0.5  $\mu$ L  
**Recommended Liner:** Zebron PLUS Single Taper Z-Liner  
**Liner Part No.:** [AG2-0A13-05](#)  
**Carrier Gas:** Helium @ 3 mL/min (constant flow)  
**Oven Program:** 80  $^{\circ}$ C to 180  $^{\circ}$ C @ 20  $^{\circ}$ C/min for 20 min  
**Detector:** Flame Ionization (FID) @ 250  $^{\circ}$ C  
**Sample:**
1. Benzene
  2. Acetonitrile
  3. 1,2-Propanediol
  4. Ethylene glycol
  5. 1,3-Propanediol (internal standard)
  6. Diethylene glycol
  7. Glycerol
  8. Triethylene glycol

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