



## Hydrocarbons, C<sub>1</sub> - C<sub>6</sub>

# Analysis of reference standard for impurities in 1,3-butadiene for ASTM method

## Application Note

Materials Testing & Research

### Authors

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### Introduction

Hydrocarbon impurities are usually measured using Agilent Al<sub>2</sub>O<sub>3</sub> PLOT columns which provide the best separation. Pentadienes, however, can cause problems with reactive sites, and response factors for some unsaturated hydrocarbons can vary using different alumina columns. The Agilent CP-Select 624 CB phase provides excellent separation for many components analyzed in high purity 1,3-butadiene. Using a 0.15 mm microbore column allows fast separation and can be used in all standard GC systems.



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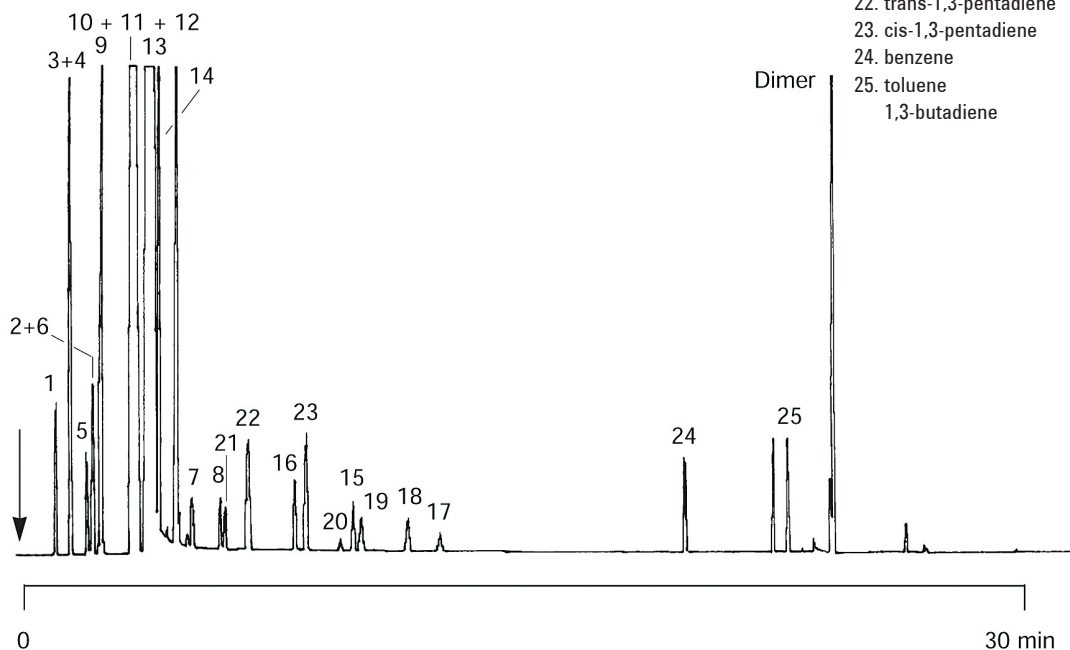
## Conditions

Technique : GC-capillary  
 Column : Agilent CP-Select 624 CB, 0.15 mm x 15 m fused silica WCOT (df = 0.9 µm) (Custom-made)  
 Temperature : -20 °C (3 min) → 10 °C, 2 °C/min;  
 10 °C (0 min) → 200 °C, 8 °C/min  
 Carrier Gas : He, 110 kPa (1.1 bar, 16 psi)  
 Injector : Split, via 4-port valve 1:100,  
 T = 200 °C  
 Detector : FID,  
 T = 250 °C  
 Sample Size : 1 µL, liquid  
 Concentration Range : 20 - 2000 ppm in 1,3 butadiene  
 Courtesy : L. d'Agostaro, H. Zhou and R. Cook,  
 DCG Partnership, Pearland, Texas

## Peak identification

## Concentration in ppm

1. acetylene	20.70
2. propane	19.80
3. propylene	296.00
4. allene	21.10
5. propyne	21.00
6. cyclopropane	20.00
7. isobutane	506
8. n-butane	494
9. cis-2-butene	1946
10. trans-2-butene	2073
11. butene-1	999
12. isobutylene	495
13. 1,2 butadiene	28.9
14. 1 butyne	20.2
15. isopentane	50.1
16. n-pentane	50.1
17. pentene-1	29.8
18. isoprene	20.0
19. 3-methyl-1-butene	19.8
20. trans-2-pentene	5.57
21. cis-2-pentene	13.9
22. trans-1,3-pentadiene	13.8
23. cis-1,3-pentadiene	7.73
24. benzene	20.3
25. toluene	20.2
1,3-butadiene	Balance



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