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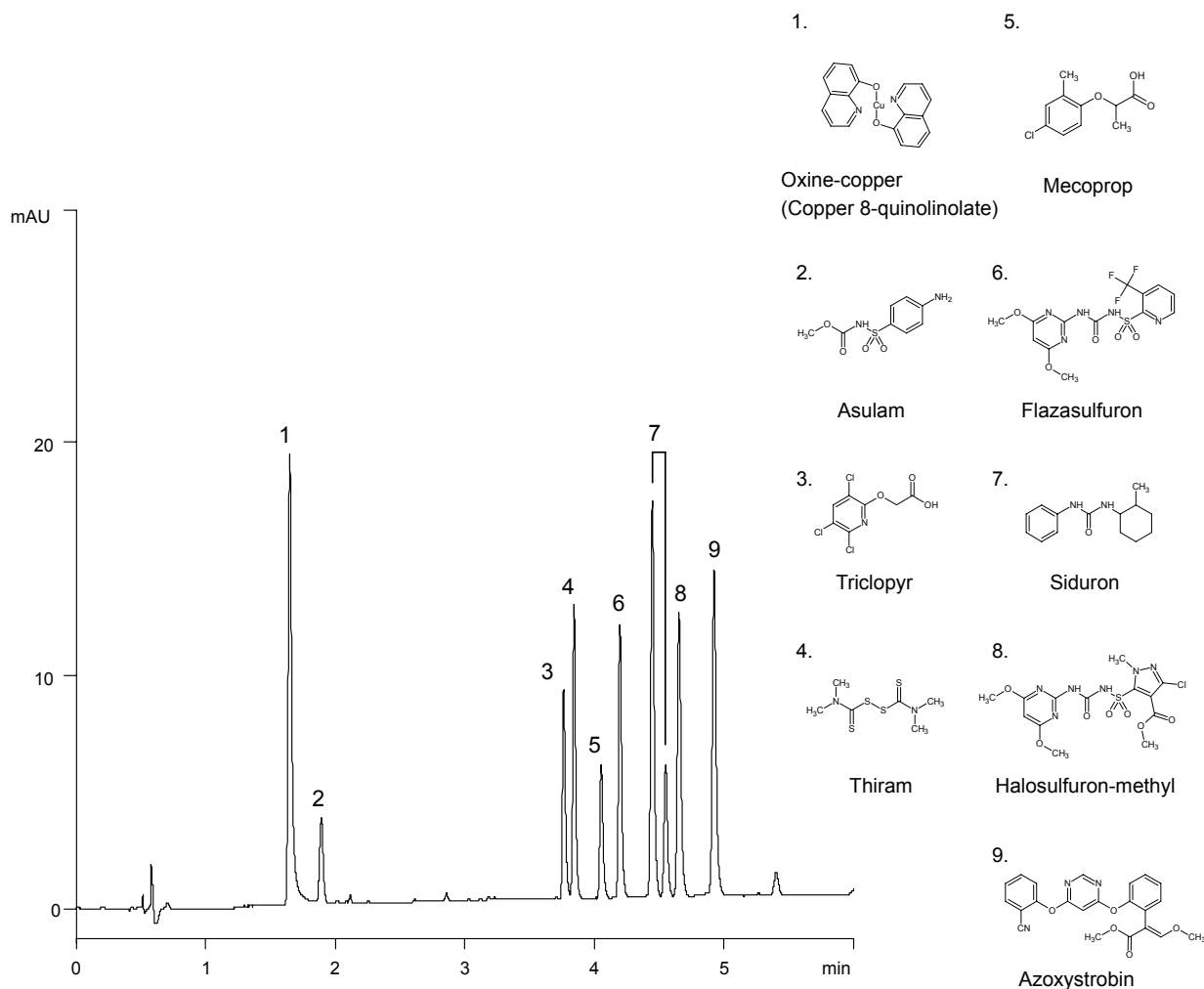
Application Collection Pesticides

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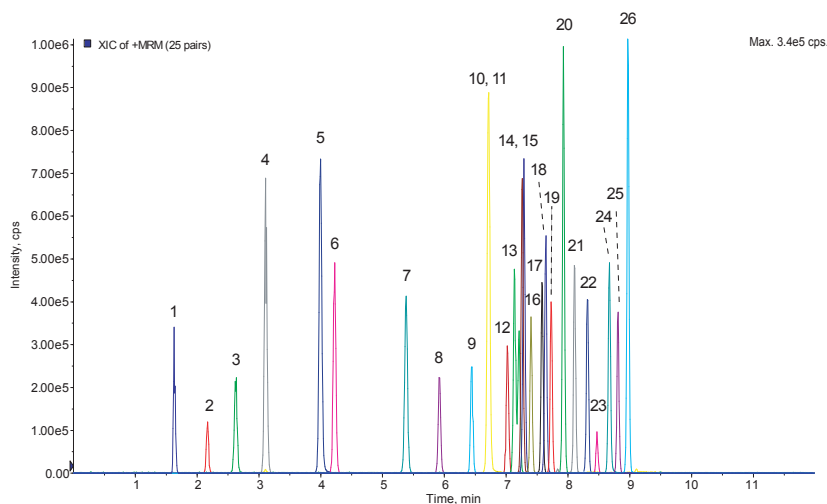
Application Collection  
**Pesticides**

## Rapid analysis of pesticides used on golf course



Column	: YMC-UltraHT Hydrosphere C18 (2 $\mu$ m, 12 nm) 100 X 3.0 mmI.D.
Eluent	: A) 20 mM KH <sub>2</sub> PO <sub>4</sub> (pH 3.3, adjusted with H <sub>3</sub> PO <sub>4</sub> ) B) acetonitrile 10%B (0-0.5 min), 10-50%B (0.5-3 min), 50-60%B (3-5 min), 60%B (5-6 min)
Flow rate	: 1.1 mL/min
Temperature	: 38°C
Detection	: UV at 240 nm
Injection	: 10 $\mu$ L (1 $\mu$ g/mL)
LC instrument	: Agilent 1290 Infinity LC

## Simultaneous separation of pesticides by LC/MS - fast LC



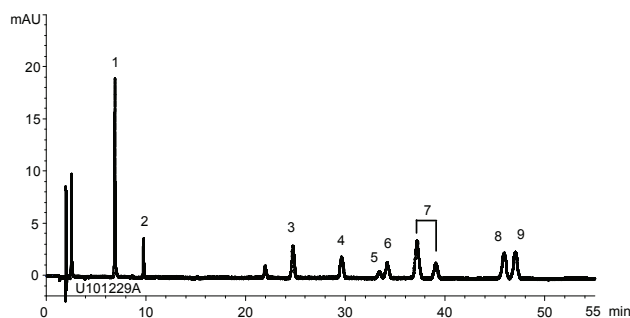
- |   |  |
|---|--|
| 1. Thiamethoxam (Q1/Q3 : 292.3/211.3)     | 14. Chromafenozide (Q1/Q3 : 395.4/175.1)     |
| 2. Clothianidin (Q1/Q3 : 250.3/169.1)     | 15. Butafenacil (Q1/Q3 : 492.1/331.1)        |
| 3. Chloridazon (Q1/Q3 : 222.3/77.0)       | 16. Simeconazole (Q1/Q3 : 249.3/70.1)        |
| 4. Thiachloprid (Q1/Q3 : 253.3/126.0)     | 17. Cyazofamid (Q1/Q3 : 325.2/108.0)         |
| 5. Thiabendazole (Q1/Q3 : 202.3/175.2)    | 18. Naproanilide (Q1/Q3 : 292.3/171.3)       |
| 6. Azamethiphos (Q1/Q3 : 325.2/183.0)     | 19. Fenoxycarb (Q1/Q3 : 302.3/88.1)          |
| 7. Dimethirimol (Q1/Q3 : 210.4/71.1)      | 20. Anilofos (Q1/Q3 : 368.2/199.1)           |
| 8. Isoxaflutole (Q1/Q3 : 360.2/251.1)     | 21. Cyflufenamid (Q1/Q3 : 431.3/295.2)       |
| 9. Pyrifthalid (Q1/Q3 : 319.3/139.1)      | 22. Pyrazolynate (Q1/Q3 : 439.1/91.0)        |
| 10. (E)-Ferimzone (Q1/Q3 : 255.4/91.1)    | 23. Indoxacarb (Q1/Q3 : 528.1/203.2)         |
| 11. (Z)-Ferimzone (Q1/Q3 : 255.4/91.1)    | 24. Benzofenap (Q1/Q3 : 431.2/105.1)         |
| 12. Methoxyfenozide (Q1/Q3 : 369.4/149.3) | 25. Furathiocarb (Q1/Q3 : 383.3/195.2)       |
| 13. Iprovalicarb (Q1/Q3 : 321.4/119.3)    | 26. Cloquintocet-mexyl (Q1/Q3 : 336.3/238.2) |

Courtesy of J.Watanabe, TAKARA BIO INC.

Column	: YMC-UltraHT Pro C18 (2 $\mu$ m, 12nm) 75 X 2.0 mmI.D.
Eluent	: A) 5 mM CH <sub>3</sub> COONH <sub>4</sub> in water B) 5 mM CH <sub>3</sub> COONH <sub>4</sub> in methanol 15-40%B (0-0.5 min), 40%B (0.5-1.75 min), 40-50%B (1.75-3 min), 50-55%B (3-4 min), 55-95%B (4-8.75 min), 95%B (8.75-11 min)
Flow rate	: 0.4 mL/min
Temperature	: ambient
Detection	: API5000, ESI, Positive, MRM
Injection	: 3 $\mu$ L (10 ng/mL)
Sample	: Pesticide Mixture Standard Solution PL-7-2, manufactured by Wako Pure Chemical Industries, Ltd.

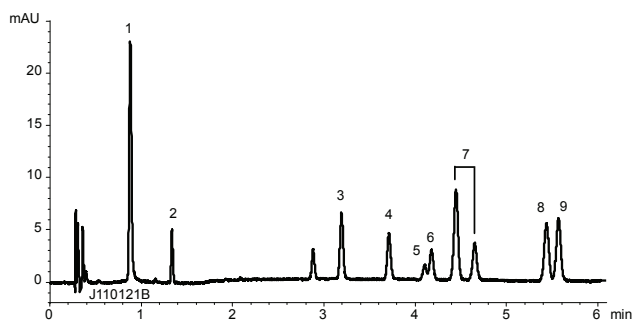
## Pesticides used on golf course – method transfer from HPLC to UHPLC

### Conventional LC method

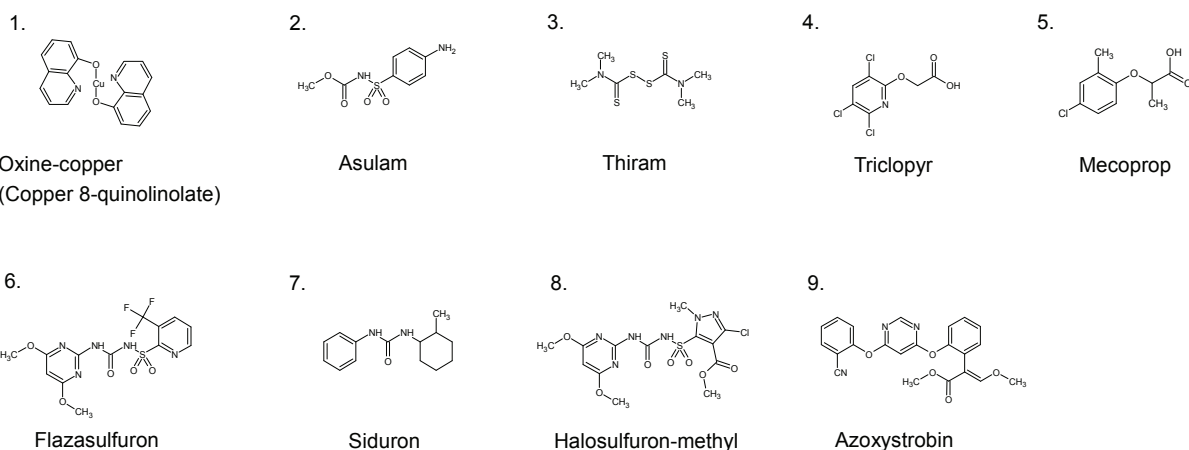


Column : YMC-Triart C18 (5  $\mu$ m, 12 nm)  
 150 X 2.0 mm I.D.  
 Flow rate : 0.2 mL/min  
 Gradient : 5%B (0-3 min),  
 5-30%B (3-10 min),  
 30-45%B (10-55 min)

### UHPLC method

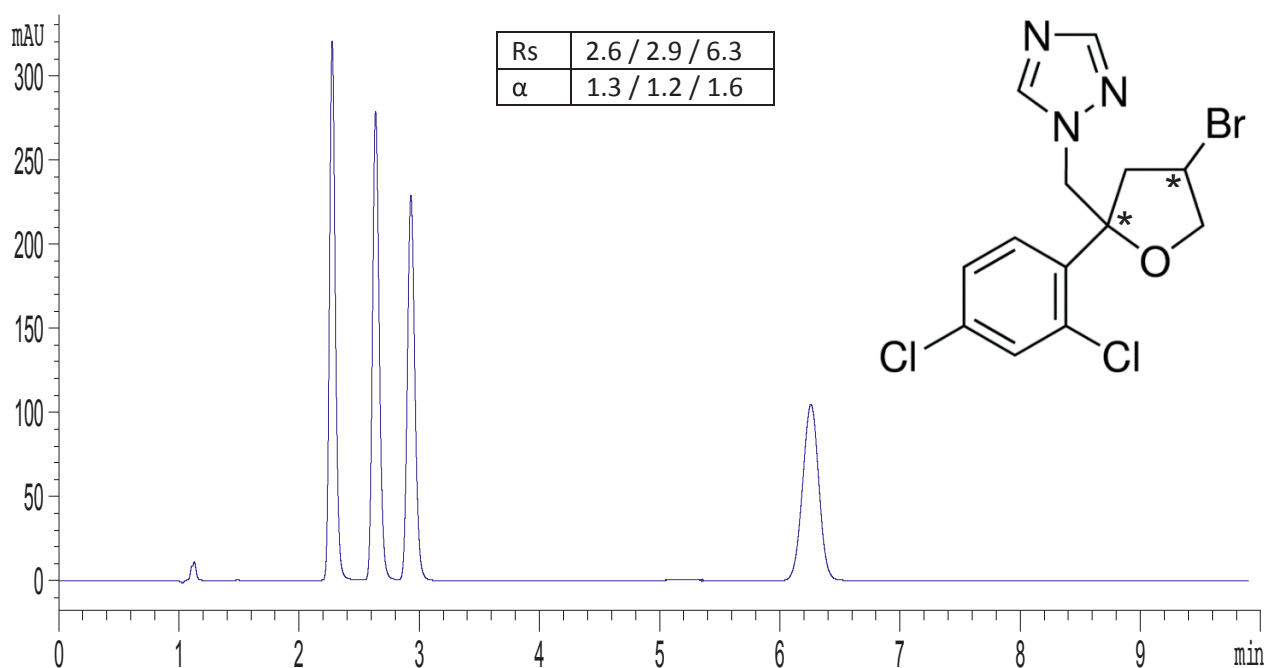


Column : YMC-Triart C18 (1.9  $\mu$ m, 12 nm)  
 50 X 2.0 mm I.D.  
 Flow rate : 0.6 mL/min  
 Gradient : 5%B (0-0.3 min),  
 5-30%B (0.3-1.0 min),  
 30-45%B (1.0-6.0 min)



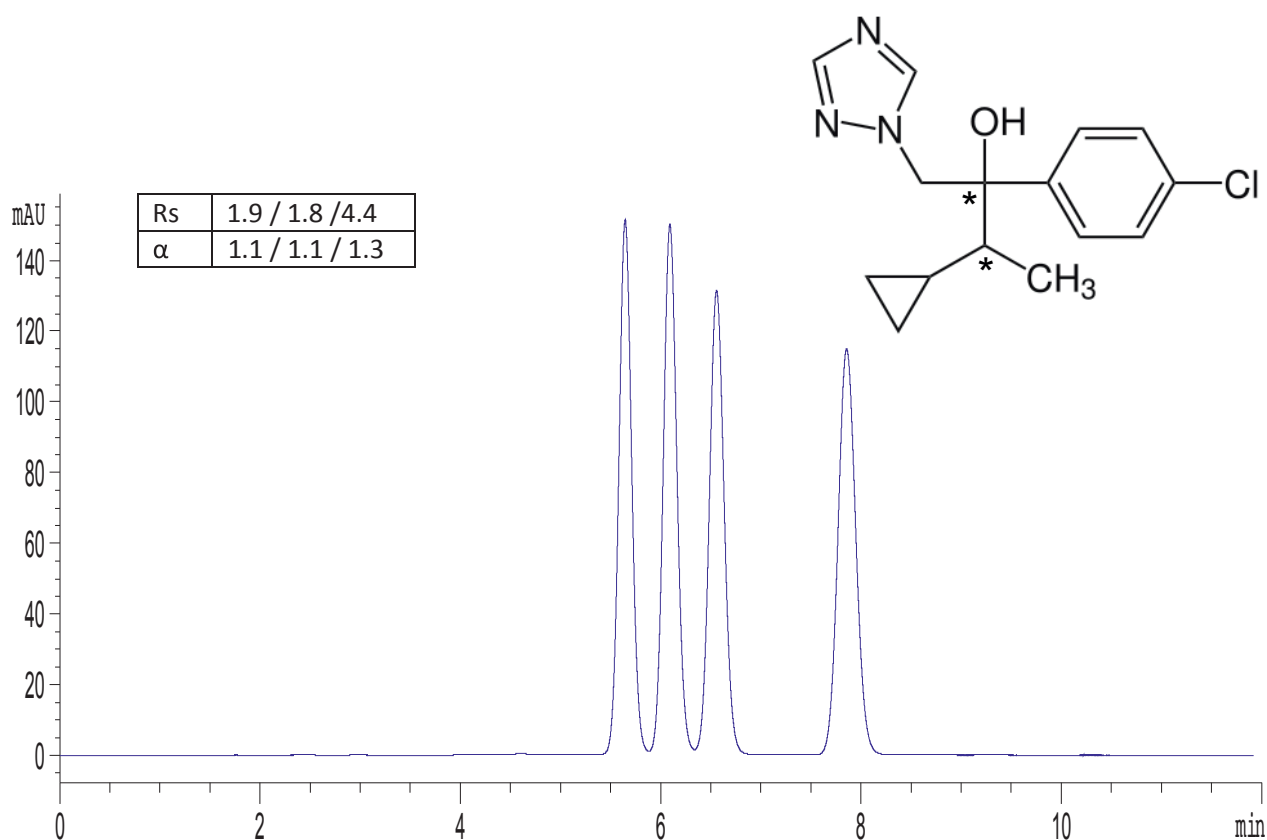
Eluent	: A) water/formic acid (100/0.1) B) acetonitrile/formic acid (100/0.1)
Temperature	: 40°C
Detection	: UV at 240 nm
Injection	: 1 $\mu$ L (5 $\mu$ g/mL)

## Bromuconazole



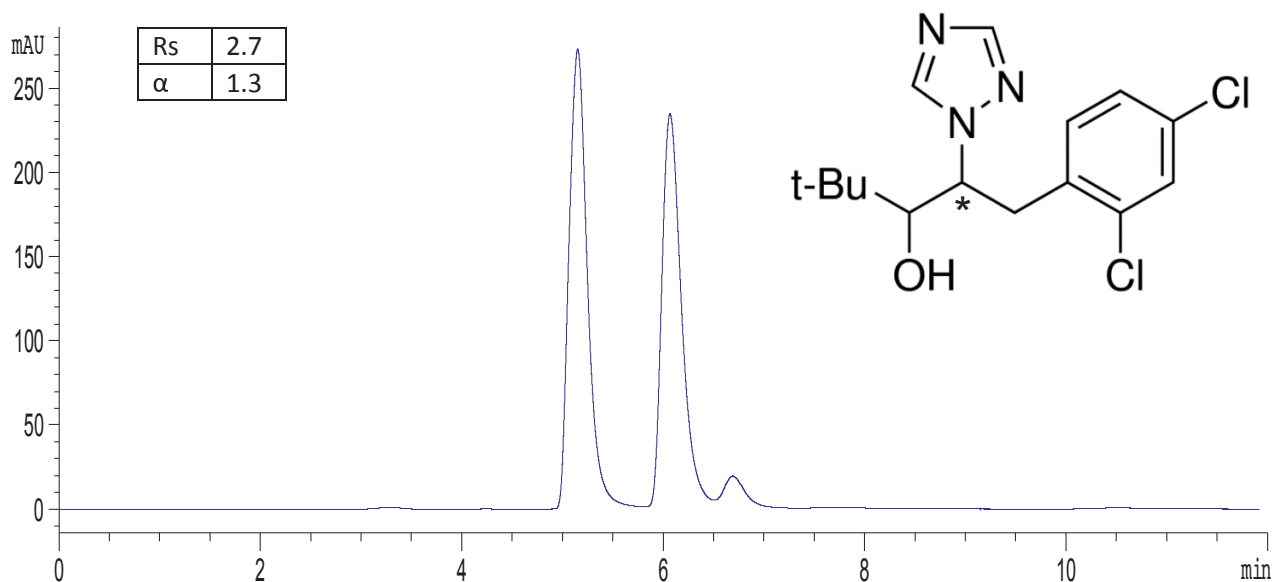
Column: CHIRAL ART Cellulose-SC (3  $\mu$ m) 150 x 3.0 mm ID  
 Part No: KSC99S03-1503WT  
 Eluent: *n*-hexane / ethanol (75/25)  
 Flow rate: 0.8 mL/min  
 Temperature: 35 °C  
 Detection: UV at 220 nm  
 Injection: 5  $\mu$ L (1 mg/mL)

## Cyproconazole



Column: CHIRAL ART Cellulose-SC (5  $\mu$ m) 250 x 4.6 mm ID  
 Part No.: KSC99S05-2546WT  
 Eluent: water / acetonitrile (48/52)  
 Flow rate: 1.2 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 10  $\mu$ L (1 mg/mL)

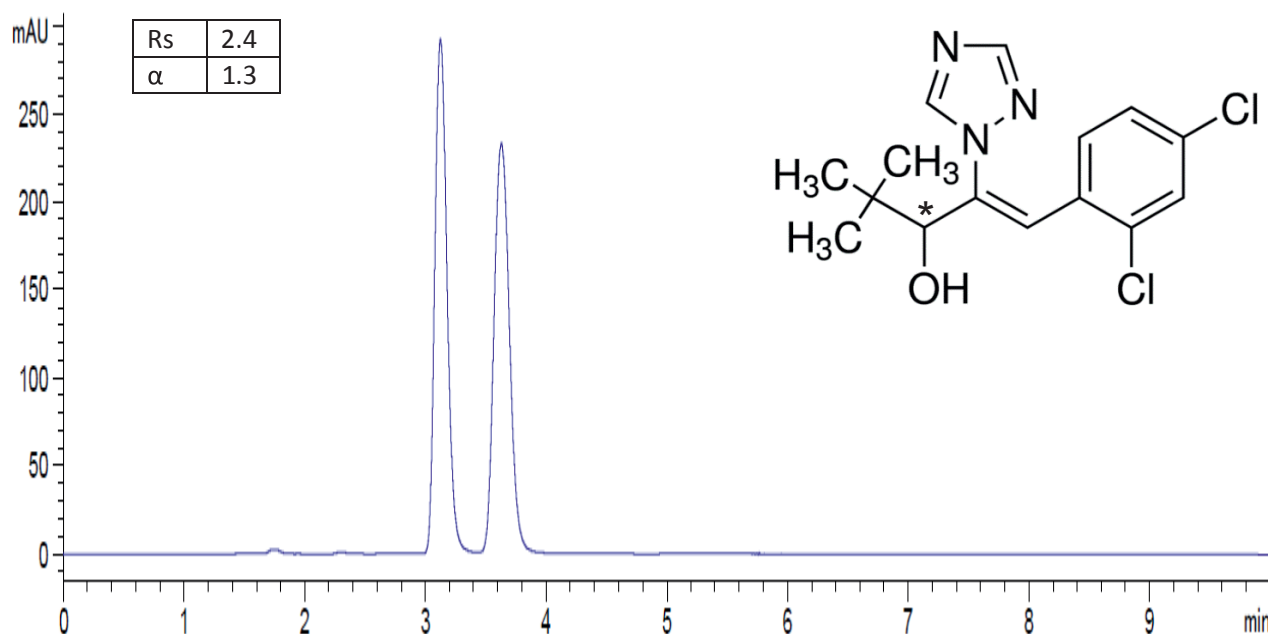
## Diclobutrazole



Column: CHIRAL ART Cellulose-SB (5  $\mu$ m) 250 x 4.6 mm ID  
 Part No.: KSB99S05-2546WT  
 Eluent: *n*-hexane / 2-propanol / diethylamine (95/5/0.1)  
 Flow rate: 0.7 mL/min  
 Temperature: 10 °C  
 Detection: UV at 220 nm  
 Injection: 10  $\mu$ L (1 mg/mL)



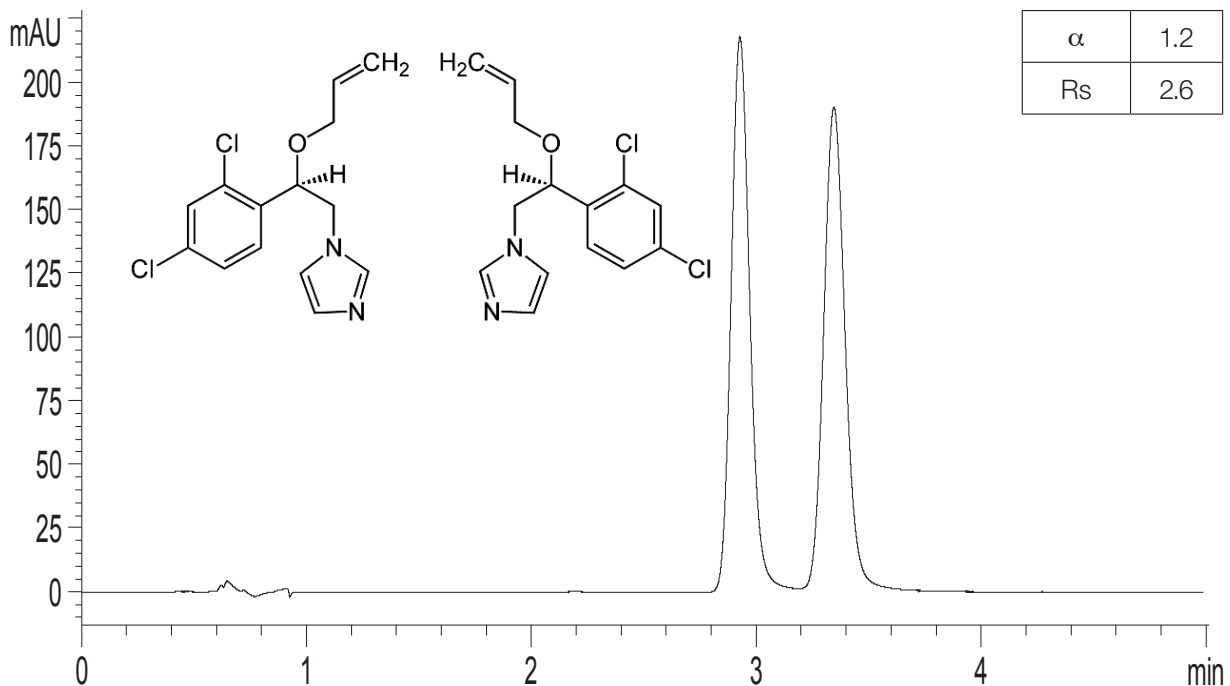
## Diniconazole



Column: CHIRAL ART Amylose-SA (3 μm) 150 x 3.0 mm ID  
 Part No.: KSA99S03-1503WT  
 Eluent: *n*-hexane / ethanol (90/10)  
 Flow rate: 0.5 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 2 μL (1 mg/mL)

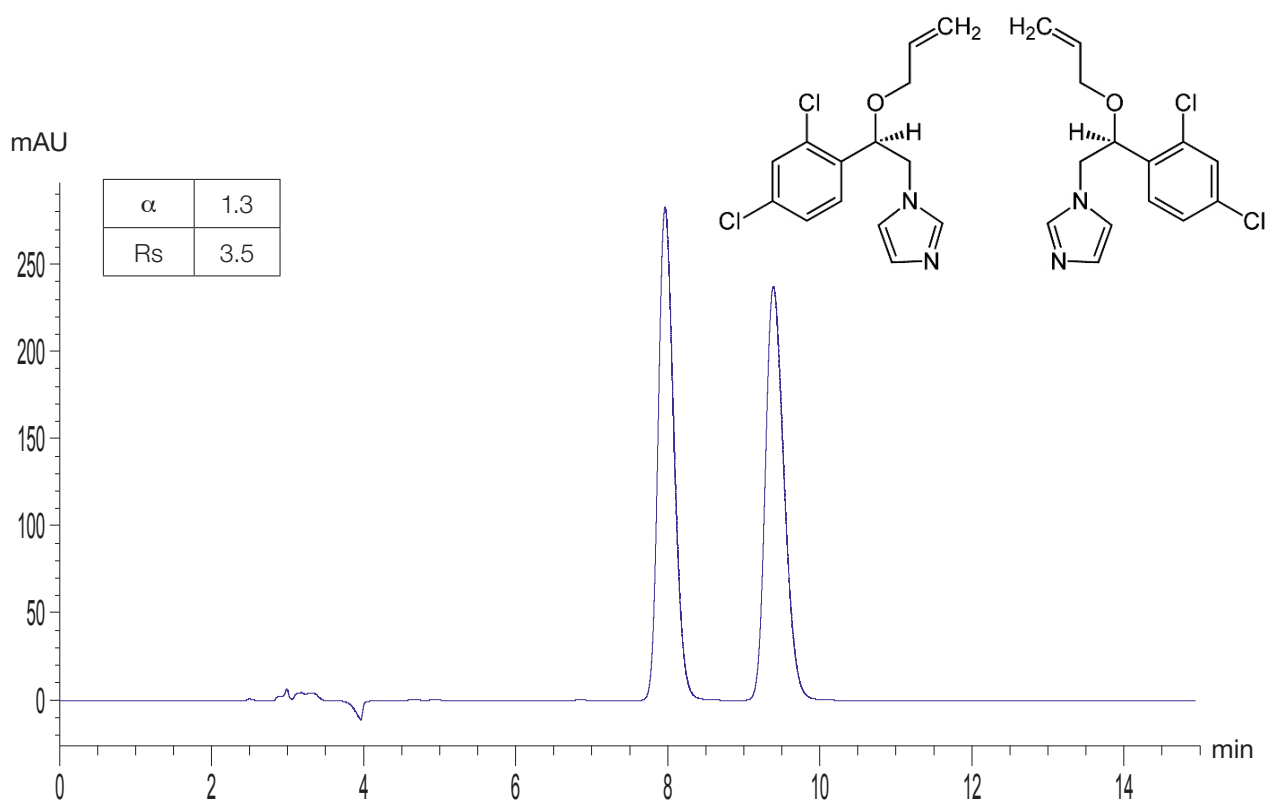


## Enilconazole



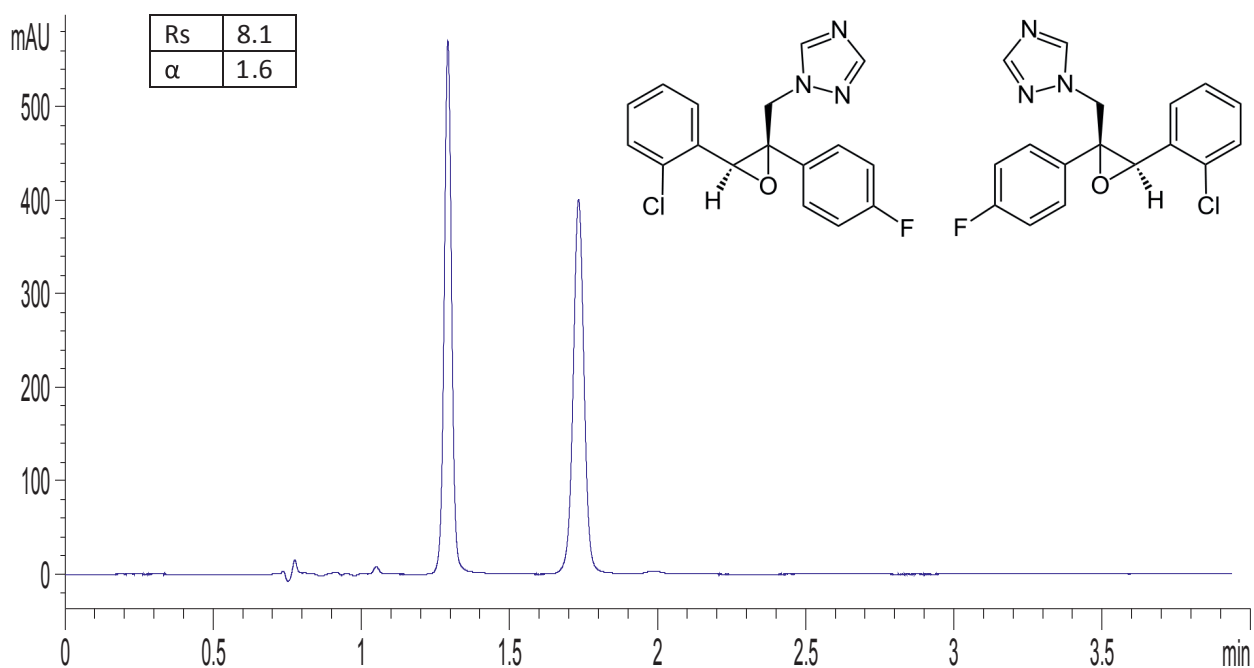
Column: CHIRAL ART Cellulose-SC (3  $\mu$ m) 50 x 4.6 mm ID  
 Part No.: KSC99S03-0546WT  
 Eluent: *n*-hexane / ethanol (90 / 10)  
 Flow rate: 1.0 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 1  $\mu$ L (1 mg/mL)

## Enilconazole (KSJ)



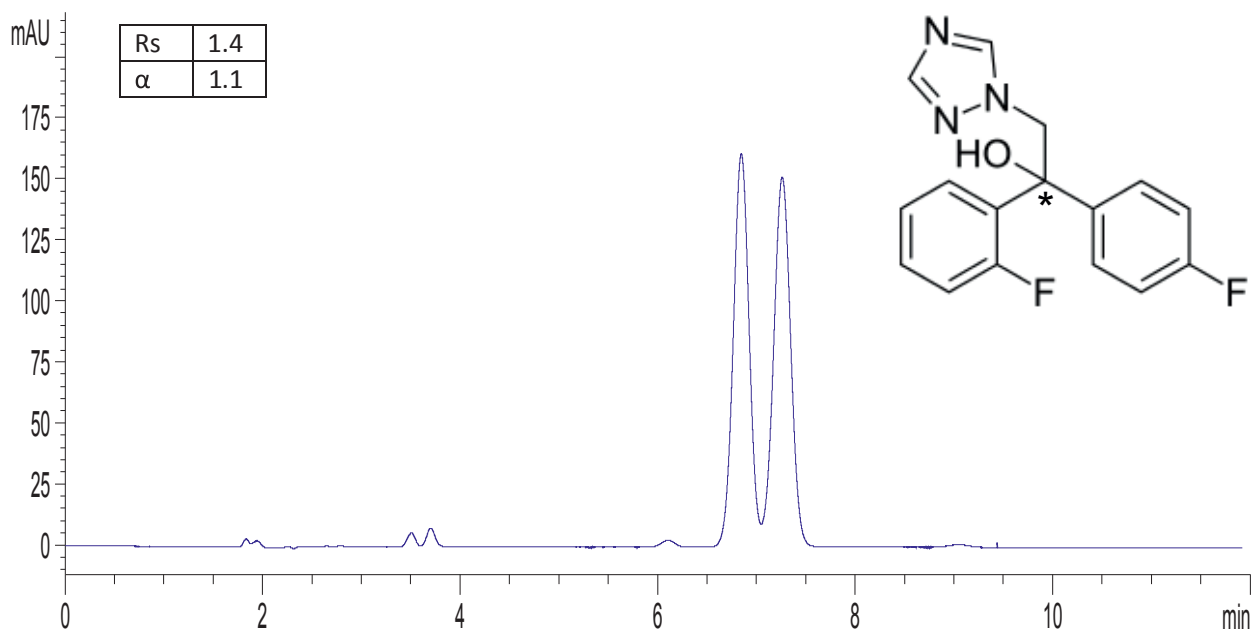
**Column:** CHIRAL ART Cellulose-SJ (5  $\mu$ m) 250 x 4.6 mm ID  
**Part No.:** KSJ99S05-2546WT  
**Eluent:** water / methanol / diethylamine (25/75/0.1)  
**Flow rate:** 1.0 mL/min  
**Temperature:** 35 °C  
**Detection:** UV at 220 nm  
**Injection:** 10  $\mu$ L (1 mg/mL)

## Epoxiconazole



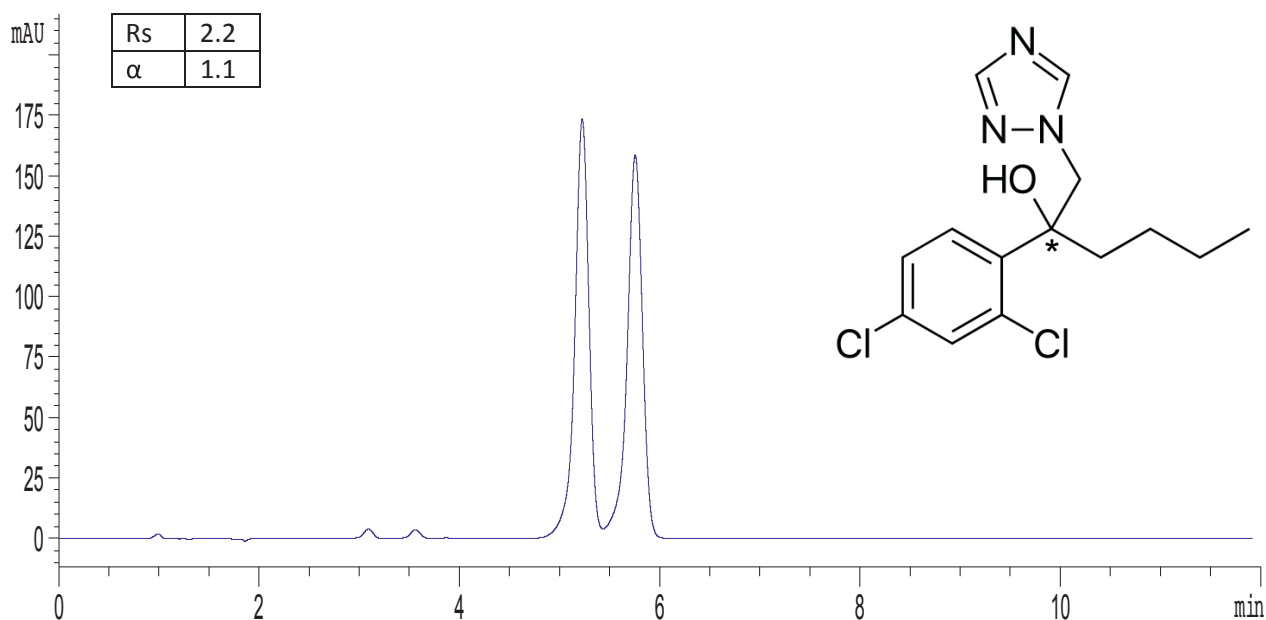
Column: CHIRAL ART Cellulose-SB (3 μm) 150 x 3.0 mm ID  
 Part No.: KSB99S03-1503WT  
 Eluent: 20mM NH<sub>4</sub>HCO<sub>3</sub> / acetonitrile / diethylamine (30/70/0.1)  
 Flow rate: 1.0 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 1 μL (1 mg/mL)

### Flutriafol



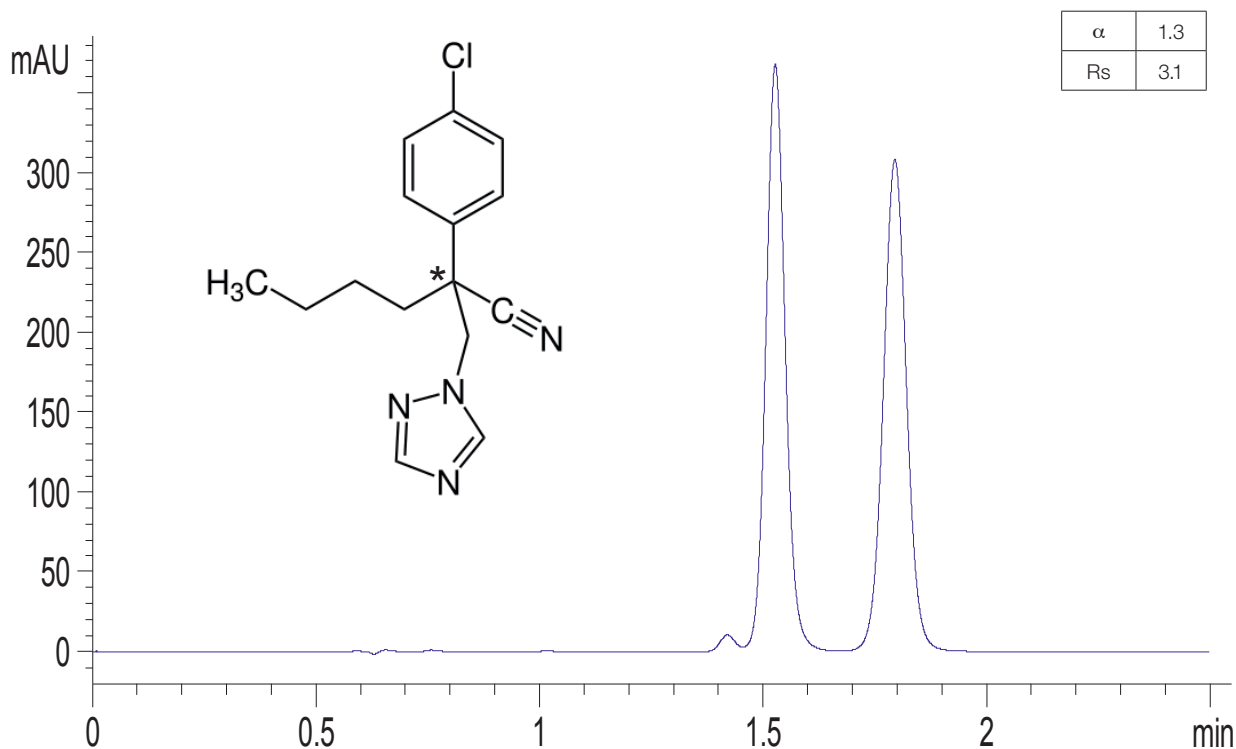
Column: CHIRAL ART Cellulose-SB (5 μm) 250 x 4.6 mm ID  
 Part No.: KSB99S05-2546WT  
 Eluent: 20 mM NH<sub>4</sub>HCO<sub>3</sub> / acetonitrile / diethylamine (60/40/0.1)  
 Flow rate: 1.5 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 5 μL (1mg/mL)

## Hexaconazole



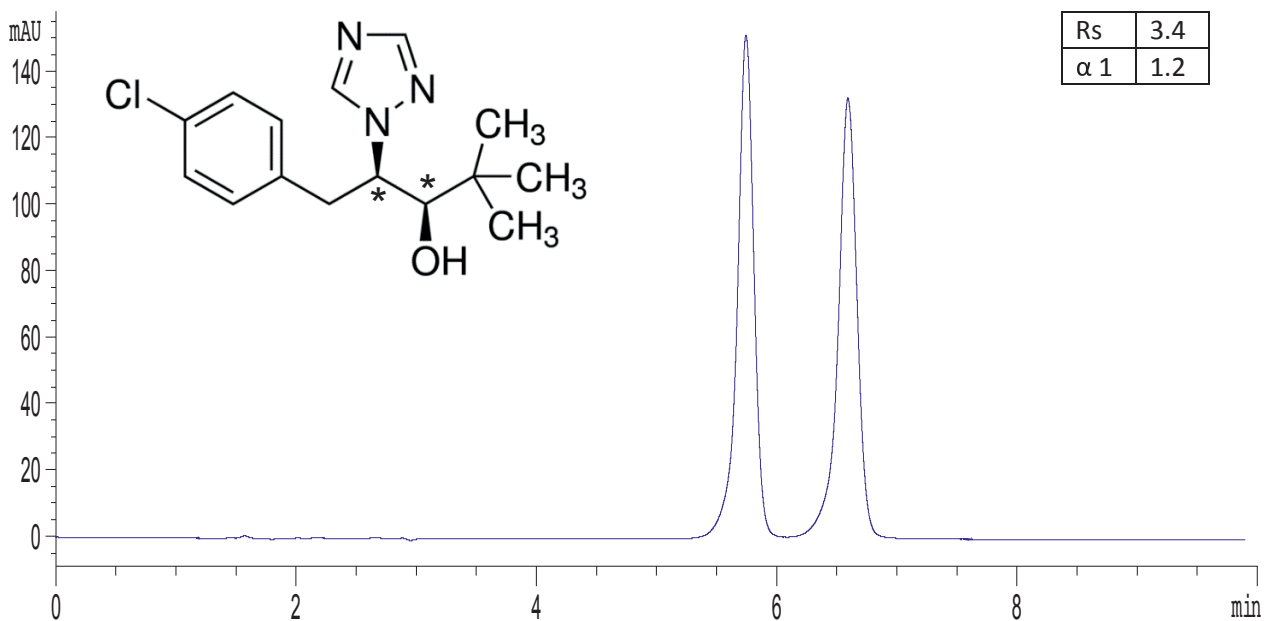
Column: CHIRAL ART Cellulose-SC (3 μm) 150 x 3.0 mm ID  
 Part No.: KSC99S03-1503WT  
 Eluent: 20 mM NH<sub>4</sub>HCO<sub>3</sub> / acetonitrile / diethylamine (58/42/0.1)  
 Flow rate: 0.8 mL/min  
 Temperature: 40 °C  
 Detection: UV at 220 nm  
 Injection: 3 μL (1 mg/mL)

## Myclobutanil



Column: CHIRAL ART Cellulose-SB (3  $\mu$ m) 50 x 4.6 mm ID  
 Part No.: KSB99S03-0546WT  
 Eluent: water / acetonitrile (45 / 55)  
 Flow rate: 1.0 mL/min  
 Temperature: 30 °C  
 Detection: UV at 220 nm  
 Injection: 1  $\mu$ L (1 mg/mL)

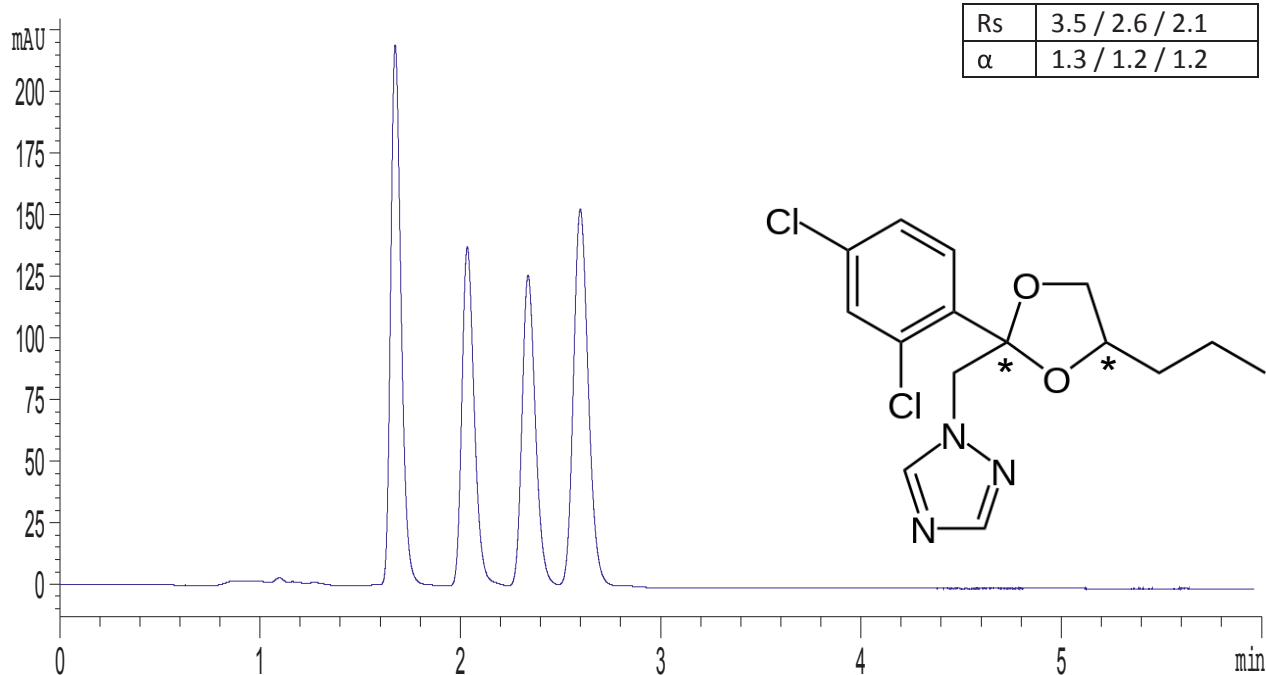
## Paclobutrazol



Column: CHIRAL ART Cellulose-SB (3  $\mu$ m) 150 x 3.0 mm ID  
 Part No.: KSB99S03-1503WT  
 Eluent: 20 mM  $\text{NH}_4\text{HCO}_3$  / acetonitrile / diethylamine (60/40/0.1)  
 Flow rate: 0.5 mL/min  
 Temperature: 25  $^\circ\text{C}$   
 Detection: UV at 220 nm  
 Injection: 2  $\mu\text{L}$  (1 mg/mL)

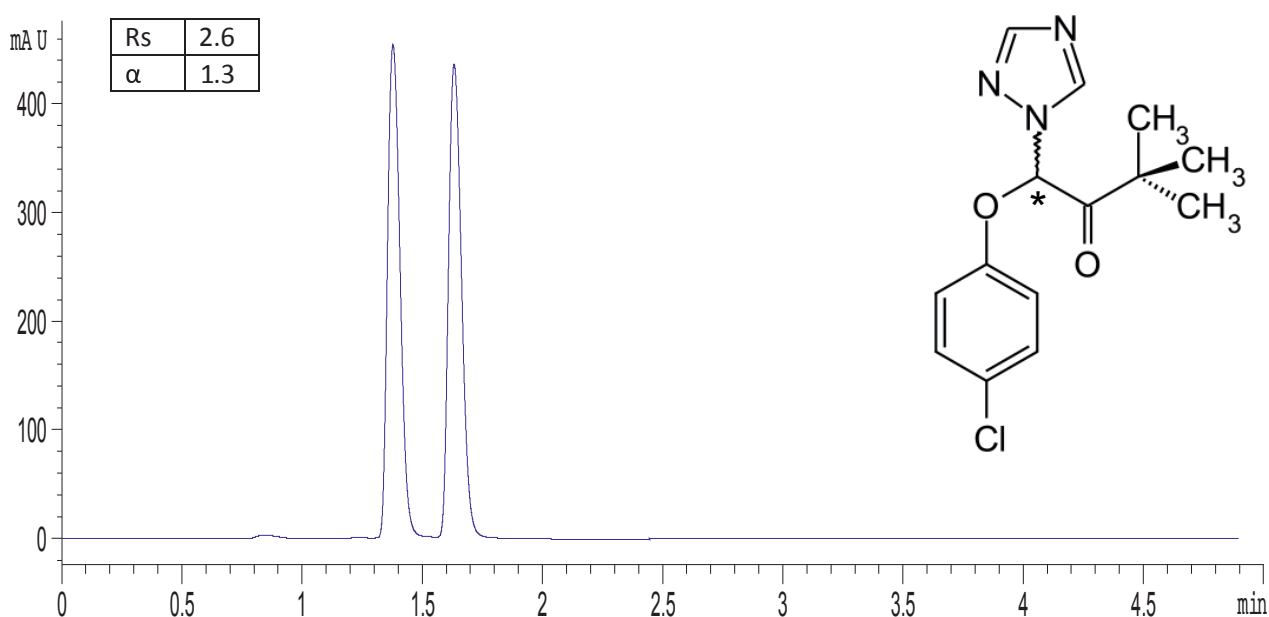


## Propiconazole



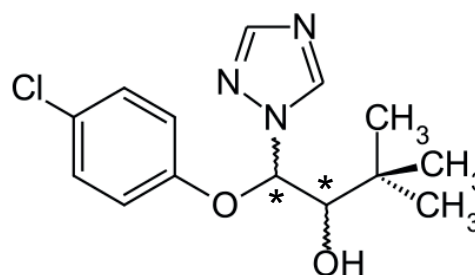
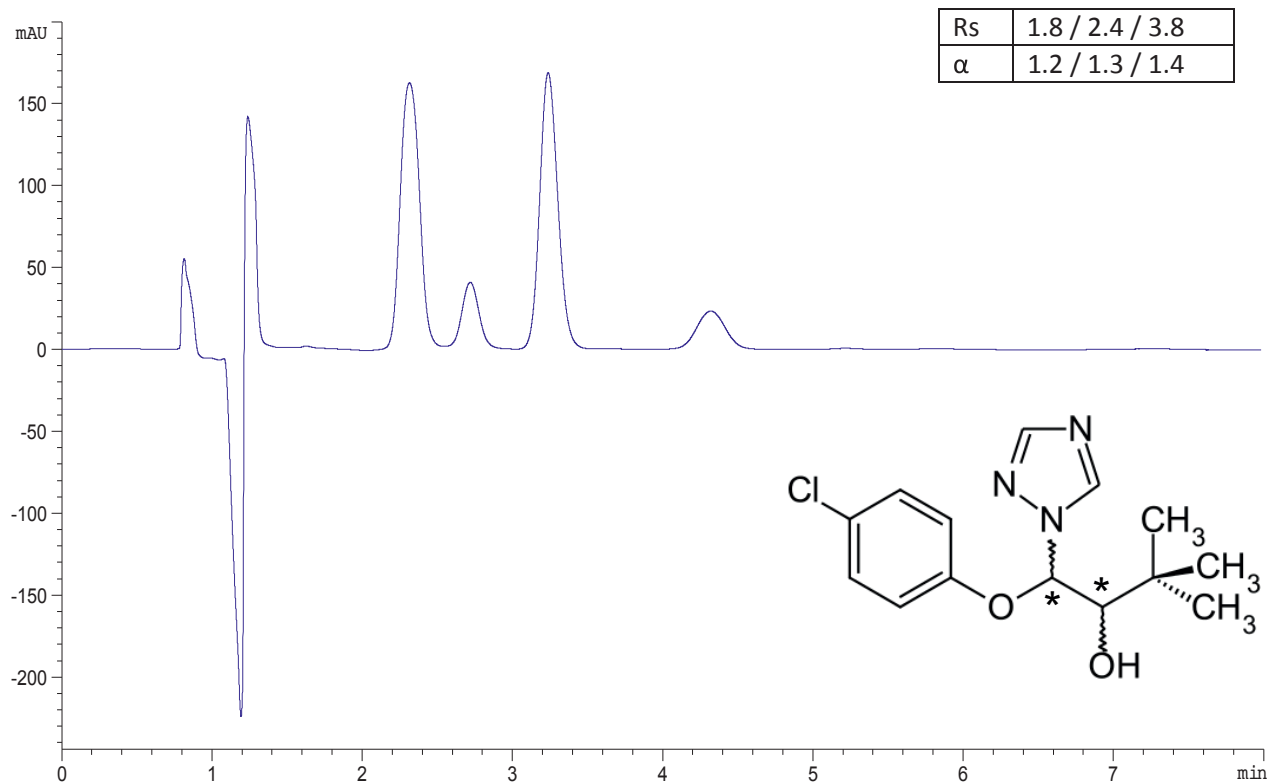
Column: CHIRAL ART Cellulose-C (3  $\mu$ m) 150 x 3.0 mm ID  
 Part No.: KCN99S03-1503WT  
 Eluent: *n*-hexane / 2-propanol (75/25)  
 Flow rate: 1.0 mL/min  
 Temperature: 10 °C  
 Detection: UV at 220 nm  
 Injection: 5  $\mu$ L (1 mg/mL)

## Triadimefon



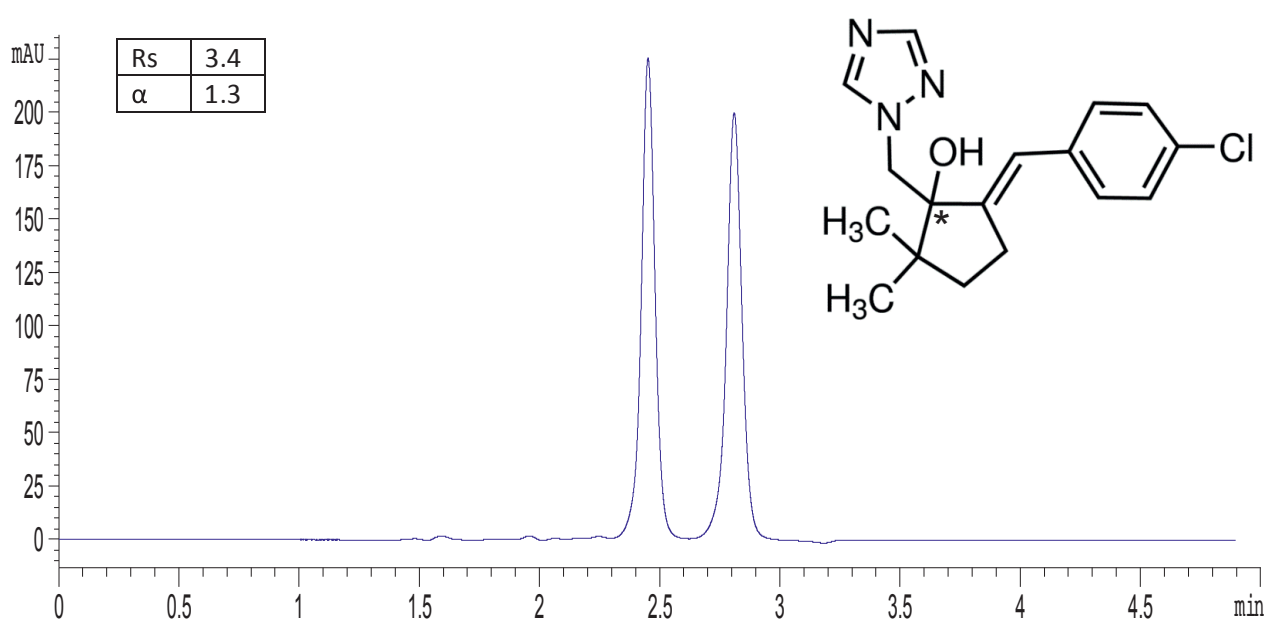
Column: CHIRAL ART Cellulose-C (3  $\mu$ m) 150 x 3.0 mm ID  
 Part No.: KCN99S03-1503WT  
 Eluent: *n*-hexane / 2-propanol (90/10)  
 Flow rate: 1.0 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 10  $\mu$ L (1 mg/mL)

## Triadimenol




Column: CHIRAL ART Amylose-C (3  $\mu$ m) 150 x 3.0 mm ID  
 Part No.: KAN99S03-1503WT  
 Eluent: *n*-heptane / ethanol / diethylamine (92/8/0.1)  
 Flow rate: 1.0 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 5  $\mu$ L (1 mg/mL)

## Triticonazole



Column: CHIRAL ART Cellulose-SB (3 μm) 150 x 3.0 mm ID  
 Part No.: KSB99S03-1503WT  
 Eluent: 20 mM NH<sub>4</sub>HCO<sub>3</sub> / acetonitrile / diethylamine (70/30/0.1)  
 Flow rate: 0.5 mL/min  
 Temperature: 25 °C  
 Detection: UV at 220 nm  
 Injection: 2 μL (1 mg/mL)

A single green flower with a dark center is in focus, set against a background of tall, thin green grasses that are slightly blurred. The overall color palette is various shades of green.

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