On-line preconcentration and chiral separation of propiconazole by cyclodextrin-modified micellar electrokinetic chromatography

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First Author	
Last Author	
Authors	Ibrahim, WAW; Hermawan, D; Sanagi, MM;
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Abstract	A method for the chiral separation of propiconazole using cyclodextrin-modified micellar electrokinetic chromatography (CD-MEKC with hydroxypropyl-gamma-cyclodextrin (HP-gamma-CD) as chiral selector is reported. The use of a mixture of 30 mM HP-gamma-CD, 50 mM SDS, methanol-acetonitrile 10%:5% (v/v) in 25 mM phosphate buffer solution was able to separate two enantiomeric pairs of propiconazole. Stacking-and sweeping-CD-MEKC under neutral pH (pH 7) and under acidic condition (pH 3.0) were used as two on-line preconcentration methods to increase detection sensitivity of propiconazole. Good repeatabilities in the migration time, peak area and peak height were obtained in terms of relative standard deviation (RSD). A sensitivity enhancement factor of 100-fold was achieved using sweeping-CD-MEKC at acidic pH. This is the first report on the separation of two pairs of propiconazole enantiomers and all the enantiomers of fenbuconazole and tebuconazole using sweeping-CD-MEKC. The limit of detection (S/N = 3) for the three triazole fungicides ranged from 0.09 to 0.1 mu g/mL, which is well below the maximum residue limits (MRL) set by Codex Alimentarius Commission (CAC. Combination of solid-phase extraction (SPE) pretreatment and sweeping-CD-MEKC procedure was applied to the determination of selected triazole fungicides in grapes samples spiked at concentration 10-40 times lower than the MRL established by the CAC. The average recoveries of the selected fungicides in spiked grapes samples were good, ranging from 73% to 109% with RSD of 9-12% (n = 3). (C) 2007 Elsevier B.V. All rights reserved.
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Author	Prof. DADAN HERMAWAN, S.Si, M.Si, Ph.D