



# Agilent Technologies

## **Agilent CP-Chirasil-Dex CB**

A collection of citations to advance your research

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## Environmental

[Enantiomeric separation of volatile organics by gas chromatography for the in situ analysis of extraterrestrial materials: Kinetics and thermodynamics investigation of various chiral stationary phases](#)

*Journal of Chromatography A*, **1306**, 59-71  
(2013)  
C. Freissinet *et al.*

**Tags**  
CP-Chirasil-Dex CB, CP-Chirasil Val,  
environmental, soils, sludges and sediments

### Abstract

The authors assessed several chiral GC columns to select one for the Sample Analysis at Mars experiment on the Martian rover. The Agilent J&W CP-Chirasil-Dex CB column was chosen as the only chiral column for this space mission, and for the next Martian mission, ExoMars. Published by Elsevier B. V.

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[Processing of meteoritic organic materials as a possible analog of early molecular evolution in planetary environments](#)

*PNAS*, **110**, 15614-15619 (2013)  
Sandra Pizzarello *et al.*

**Tags**  
CP-Chirasil Dex CB, DB-17, 6890N, 5973N,  
environmental, soils, sludges and sediments

### Abstract

GC/MS analysis of insoluble organic material from a meteorite was achieved using Agilent J&W CP-Chirasil-Dex CB and DB-17 GC columns on an Agilent 6890N/5973N GC/MS. Published by PNAS.

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## Genomics

### [Isolation of an \$\sigma\$ -Alkyl Iridium Hydride Complex, Formed in the \(Semi\) hydrogenation of an \$\beta\$ -Enamido Ketone](#)

*Journal of Organic Chemistry*, **78**, 3425-3428  
(2013)  
Frauke Maurer, Uli Kazmaier

**Tags**  
CP-Chirasil-Dex CB, genomics

#### **Abstract**

$\sigma$ -Alkyl iridium hydride complexes are generally postulated as intermediates in iridium-catalyzed hydrogenation. Fast reductive elimination results in the formation of the hydrogenation product. With an  $\beta$ -enamido ketone as unsaturated substrate, such an intermediate could be trapped because the semihydrogenated product coordinates trifold to the iridium, generating a stable 18e<sup>-</sup> complex, which does not eliminate. Reprinted with permission from the Journal of Organic Chemistry. Copyright 2013 American Chemical Society.

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### [Overcoming co-product inhibition in the nicotinamide independent asymmetric bioreduction of activated C=C-bonds using flavin-dependent ene-reductases](#)

*Biotechnology and Bioengineering*, **110**, 3085-3092 (2013)  
Christoph K. Winkler *et al.*

**Tags**  
CP-Chirasil-Dex CB, genomics

#### **Abstract**

Enantiomeric excess in a study of flavoprotein catalysts was measured using an Agilent J&W CP-Chirasil-DEX CB GC column. Published by John Wiley and Sons Ltd.

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### [Acetophenone reductase with extreme stability against a high concentration of organic compounds or an elevated temperature](#)

*Applied Microbiology and Biotechnology*, **97**, 10413-10421 (2013)  
Takuro Yamamoto *et al.*

**Tags**  
CP-Chirasil-Dex CB, genomics

#### **Abstract**

The optical purity of acetophenone reductase was determined using an Agilent J&W CP-Chirasil-Dex CB column. Published by Springer.

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[An enoate reductase Achr-OYE4 from \*Achromobacter\* sp. JA81: characterization and application in asymmetric bioreduction of C=C bonds](#)

*Applied Microbiology and Biotechnology*, **98**,  
705-715 (2014)  
Hai-Bo Wang, Xiao-Qiong Pei, Zhong-Liu Wu

**Tags**  
CP-Chirasil-Dex CB, genomics

**Abstract**

Enantiomeric excess in a study of enoate reductase was assessed using an Agilent J&W CP-Chirasil-DEX CB GC column. Published by Springer.

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[Lactones 41. Synthesis and Microbial Hydroxylation of Unsaturated Terpenoid Lactones with \*p\*-Menthane Ring Systems](#)

*Molecules*, **18**, 2778-2787 (2013)  
Aleksandra Grudniewska, Czesław  
Wawrzeńczyk

CP-Chirasil-Dex CB, 6890N, genomics

**Abstract**

Racemic [(±)-4-isopropyl-1-methyl-7-oxa-*cis*-bicyclo[4.3.0]non-4-en-8-one] and optically active δ,ε-unsaturated lactones [(-)-(1*R*,6*R*)-4-isopropyl-1-methyl-7-oxabicyclo[4.3.0]non-4-en-8-one and (+)-(1*S*,6*S*)-4-isopropyl-1-methyl-7-oxabicyclo[4.3.0]non-4-en-8-one]] with the *p*-menthane system were obtained and their odoriferous properties were evaluated. Biotransformations of the racemic lactone with three fungal strains: *Absidia cylindrospora* AM336, *Absidia glauca* AM177 and *Syncephalastrum racemosum* AM105, were carried out. Microbial transformations afforded hydroxylactones with the hydroxy group in the allylic position. © The Authors.

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[Functional assembly of camphor converting two-component Baeyer–Villiger monooxygenases with a flavin reductase from \*E. coli\*](#)

*Applied Microbiology and Biotechnology*, **98**,  
705-715 (2014)  
Maria Kadow *et al.*

CP-Chirasil-Dex CB, genomics

**Abstract**

Quantification of flavin reductase biocatalysts was performed using an Agilent J&W CP-Chirasil-Dex CB GC column. Published by Springer.

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[Thermostable alcohol dehydrogenase from \*Thermococcus kodakarensis\* KOD1 for enantioselective bioconversion of aromatic secondary alcohols](#)

*Applied and Environmental Microbiology*, **79**, CP-Chirasil-Dex CB, genomics  
2209-2217 (2013)  
Xi Wu *et al.*

**Abstract**

Absolute configurations of product alcohols were identified using an Agilent J&W CP-Chirasil-DEX CB GC column. Published by the American Society for Microbiology.

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[Asymmetric Synthesis of Nonracemic Primary Amines via Spiroborate Catalyzed Reduction of pure \(E\)- and \(Z\)-O-Benzoyloximes: Applications toward the Synthesis of Calcimimetic Agents](#)

*Journal of Organic Chemistry*, **78**, 5314-5327 CP-Chirasil-Dex CB, genomics  
(2013)  
Wenhua Ou *et al.*

**Abstract**

Highly enantiopure (1-aryl)- and (1-naphthyl)-1-ethylamines were synthesized by the borane-mediated reduction of single-isomeric (*E*)- and (*Z*)-*O*-benzyloxime ethers using the stable spiroborate ester derived from (*S*)-diphenyl valinol and ethylene glycol as the chiral catalyst. Primary (*R*)-arylethylamines were prepared by the reduction of pure (*Z*)-ethanone oxime ethers in up to 99% *ee* using 15% of catalyst. Two convenient and facile approaches to the synthesis of new and known calcimimetic analogues employing enantiopure (1-naphthalen-1-yl)ethylamine as chiral precursor are described. Reprinted with permission from the Journal of Organic Chemistry. Copyright 2013 American Chemical Society.

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### [A Self-organizing Chemical Assembly Line](#)

*Journal of the American Chemical Society*, **135**, CP-Chirasil-Dex CB, genomics  
19143-19146 (2013)  
Airton G. Salles *et al.*

#### **Abstract**

Chemical syntheses generally involve a series of discrete transformations whereby a simple set of starting materials are progressively rendered more complex. In contrast, living systems accomplish their syntheses within complex chemical mixtures, wherein the self-organization of biomolecules allows them to form “assembly lines” that transform simple starting materials into more complex products. Here we demonstrate the functioning of an abiological chemical system whose simple parts self-organize into a complex system capable of directing the multistep transformation of the small molecules furan, dioxygen, and nitromethane into a more complex and information-rich product. The novel use of a self-assembling container molecule to catalytically transform a high-energy intermediate is central to the system’s functioning. Reprinted with permission from the *Journal of American Chemical Society*. Copyright 2013 American Chemical Society.

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### [Enantioselective Hydrolysis of dl-Menthyl Benzoate by Cell-Free Extract of Newly Isolated \*Acinetobacter\* sp. ECU2040](#)

*Applied Biochemistry and Biotechnology*, **170**, CP-Chirasil-Dex CB, genomics  
1974-1981 (2013)  
Minh-Thu Ngo-Thi *et al.*

#### **Abstract**

Enantiomeric excess of product and conversion of substrate were determined on an Agilent 6820 GC with FID and an Agilent CP-Chirasil-Dex CB column. Published by Springer B. V.

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## [Stereoselective Reduction Of Some B-Ketoesters By \*Brassica rapa\* And \*Daucus carota\* Using Plant Roots And Plant Cultured Cells](#)

*International Journal of ChemTech Research*, **5**, CP-Chirasil-Dex CB, genomics  
1744-1749 (2013)  
Katayoun Javidnia et al.

### **Abstract**

Biotransformation reactions were monitored by GC/MS in an Agilent 7890A equipped with an Agilent J&W HP-5 capillary column, whereas enantiomeric excess was determined by GC/FID analysis in an Agilent 6890N GC with an Agilent J&W CP-Chirasil-DEX CB column. Published by sphinxsai.com.

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## **Materials testing and research**

### [Chemical Equilibrium Controlled Etching of MFI-type Zeolite and its Influence on Zeolite Structure, Acidity and Catalytic Activity](#)

*Chemistry of Materials*, **25**, 2759-2766 (2013)  
Z. Qin et al.

### **Tags**

CP-Chirasil-Dex CB, materials testing and research

### **Abstract**

Chemical etching with fluoride ions is a new approach for secondary porosity engineering of aluminosilicate zeolite frameworks. We show that diluted HF solutions extract preferentially aluminum from zeolite frameworks. The Brønsted acidity of ZSM-5 treated in such a way decreases, while its structure is unaffected after an HF treatment. With higher HF concentrations, the number of undissociated HF molecules and the concentration of HF<sub>2</sub><sup>-</sup> ions, extracting indiscriminately Al and Si, increase. The addition of NH<sub>4</sub>F shifts the chemical equilibria to produce more HF<sub>2</sub><sup>-</sup>, avoiding the use of highly concentrated HF solutions; it also suppresses HF dissociation. The etching selectivity of such solutions is concentration-independent and extracts indiscriminately both framework Si and Al. Zeolite dissolution in NH<sub>4</sub>F-HF solutions starts preferentially at small intergrowth domains and goes deeply in the crystals without a substantial increase of the external surface area. Macropores are produced without altering zeolite acidity. Hierarchical materials obtained by these two approaches are characterized extensively by complementary methods and the catalytic impact illustrated in the *m*-xylene conversion. Reprinted with permission from Chemistry of Materials. Copyright 2013 American Chemical Society.

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[Asymmetric Catalysis on Cinchonidine-modified Pt/Al<sub>2</sub>O<sub>3</sub>: Kinetics and Isotope Effect in the Hydrogenation of Trifluoroacetophenone](#)

*Catalysis*, **4**, 344-354 (2014)  
Fabian Meemken *et al.*

**Tags**  
CP-Chirasil-Dex CB, 7890A, materials testing and research

**Abstract**

Kinetics and parametric sensitivity of the asymmetric hydrogenation and deuteration of the trifluoro-activated ketone, 2,2,2-trifluoroacetophenone (TFAP), to (*R*)-1-phenyl-2,2,2-trifluoroethanol have been studied on an alumina supported Pt catalyst modified by cinchonidine (CD). The observed catalytic behavior is explained by a reaction network consisting of three catalytic cycles which are mutually interconnected: asymmetric hydrogenation of TFAP on CD-modified sites (Pt-CD), asymmetric hydrogenation on Pt-CD sites interfering with the acidic product alcohol Pt-CD-P, and the racemic hydrogenation occurring on unmodified Pt sites. The contributions of these reaction cycles change with progress of TFAP conversion. The catalytic performance is shown to depend strongly on various factors such as the concentrations of ketone and modifier, catalyst amount, solvent, and hydrogen pressure. Depending on reaction conditions, addition of CD can induce considerable rate enhancement (*modified* > *runmodified*). Particularly striking is the influence of hydrogen pressure (coverage) on enantioselection, as higher coverage diminishes the ee, which contrasts the corresponding behavior of  $\alpha$ -ketoesters. The special role of hydrogen is investigated by substituting H<sub>2</sub> by its heavier isotope D<sub>2</sub>. With the aid of time-resolved attenuated total reflection infrared spectroscopy the kinetic effects of the isotopic substitution along with other reaction parameters are studied and a kinetic isotope effect for unmodified and modified reactions is determined, which suggests that hydrogen is involved in the rate-determining step. Reprinted with permission from *Catalysis*. Copyright 2014 American Chemical Society.

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[Protein Adsorption onto Nanozeolite: Effect of Micropore Openings](#)

*Journal of Colloid and Interface Science*, **406**,  
130-138 (2013)  
Jiamin Wu *et al.*

**Tags**  
CP-Chirasil Dex CB, materials testing and research

**Abstract**

An Agilent CP-Chirasil-Dex CB GC column was used in a study of the effect of surface micropores on protein adsorption. Published by Elsevier B.V.

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[Characterization and activity of V2O5/CeO2-MgO catalyst in the dehydrogenation of ethylbenzene to styrene](#)

*Korean Journal of Chemical Engineering*, 1-5 (2013)  
Van-Khoa Nguyen, Jung-Hyun Park, Chae-Ho Shin

**Tags**  
CP-Chirasil Dex CB, materials testing and research

**Abstract**

All products of the ethylbenzene dehydrogenation, such as styrene, benzene, toluene, and ethylbenzene, were analyzed by gas chromatography/FID using an Agilent J&W CP-Chirasil-Dex CB capillary column. Published by The Korean Institute of Chemical Engineers.

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## Small molecule pharmaceuticals and generics

[Inhalation of the Essential Oil of \*Piper guineense\* from Cameroon Shows Sedative and Anxiolytic-Like Effects in Mice](#)

*Biological and Pharmaceutical Bulletin*, **36**, 1608–1614 (2013)  
Joan Manjuh Tankam, Michiho Ito

**Tags**  
CP-Chirasil-Dex CB, HP-INNOWAX, DB-WAX, 6850, 5975, small molecule pharmaceuticals and generics, traditional medicines

**Abstract**

Qualitative analysis of *Piper guineense* essential oil was achieved using an Agilent 6850 GC equipped with an Agilent 5975 MSD and Agilent J&W CP-Chirasil-Dex CB and HP-INNOWAX GC columns. A DB-WAX column was used for quantitative analysis. Published by the Pharmaceutical Society of Japan.

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[Biocatalyst activity of entomogenous fungi: stereoselective reduction of carbonyl compounds using tochukaso and related species](#)

*International Journal of Current Microbiology and Applied Sciences*, **2**, 188-197 (2013)  
K. Ishihara *et al.*

**Tags**

CP-Chirasil-Dex CB, DB-WAX, small molecule pharmaceuticals and generics, traditional medicines

**Abstract**

Agilent J&W CP-Chirasil-Dex CB and DB-WAX GC columns were used in a study of the stereoselective reduction of -keto esters and aromatic -keto amides from fungi.

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[Preparation of Chiral Hydroxy Esters Using Actinobacteria: Biocatalyst Activity of Marine-Derived \*Micromonospora\* and \*Streptomyces\* Strains](#)

*Open Journal of Applied Sciences*, **3**, 116-122 (2013)  
K. Ishihara *et al.*

**Tags**

CP-Chirasil-Dex CB, DB-WAX, small molecule pharmaceuticals and generics, traditional medicines

**Abstract**

Agilent J&W CP-Chirasil-Dex CB and DB-WAX GC columns were used in a study of the potential for marine-derived actinomycetes to act as biocatalysts. Published by SciRes.

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## [Synthesis of Optically Pure 2-Trifluoromethyl Lactic Acid by Asymmetric Hydroformylation](#)

*The Journal of Organic Chemistry*, **78**, 3429-3433

(2013)

Xiao Wang, Stephen L. Buchwald

### Tags

CP-Chirasil-Dex CB, small molecule pharmaceuticals and generics

### Abstract

Trifluoromethylated compounds, including optically active ones, have received increasing attention in the fields of synthetic and medicinal chemistry. The construction of trifluoromethyl-substituted quaternary stereogenic centers remains a formidable challenge in organic synthesis.

Enantiomerically pure 2-trifluoromethyl lactic acid (TFMLA, **1**), also known as Soloshonok acid, serves as an important building block for many active pharmaceutical ingredients in different therapeutic areas (Scheme 1). It is also used for studying the different physical properties (in particular, sublimation behavior) between enantiomerically pure compounds and their corresponding racemic counterparts. The large-scale synthesis of **1** normally involves a Zn-mediated asymmetric addition reaction of a methyl Grignard reagent to 2,2,2-trifluoropyruvate, providing **1** with an enantiomeric excess of 50%. The enantiomerically pure compound is derived from the crude product by resolution. Shaw has reported a process that employed the addition of cyanide to trifluoroacetone, followed by an enzymatic resolution of the racemic adduct. However, an efficient enantioselective synthesis of this valuable molecule is highly desirable. Reprinted with permission from the *Journal of Organic Chemistry*. Copyright 2013 American Chemical Society.

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## [Enzymatic production of Cilastatin intermediate via highly enantioselective hydrolysis of methyl \( \$\pm\$ \)-2, 2-dimethylcyclopropane carboxylate using newly isolated \*Rhodococcus\* sp. ECU1013](#)

*Applied Microbiology and Biotechnology*, **97**,

7659–7667 (2013)

Chao-Hong Liu *et al.*

### Tags

CP-Chirasil-Dex CB, 6820, small molecule pharmaceuticals and generics

### Abstract

Quantitative determination of biotransformation yield and enantioselectivity was assayed in ethyl acetate extracts using an Agilent J&W CP-Chirasil-Dex CB capillary column in an Agilent 6820 GC. Published by Springer.

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[Inhalation of the Essential Oil of \*Piper guineense\* from Cameroon Shows Sedative and Anxiolytic-Like Effects in Mice](#)

*Biological and Pharmaceutical Bulletin*, **36**,  
1608-1614 (2013)  
Joan Manjuh Tankam, Michiho Ito

**Tags**  
CP-Chirasil Dex CB, DB-WAX, small molecule  
pharmaceuticals and generics, traditional  
medicines

**Abstract**

Qualitative analysis of PGEO was accomplished using an Agilent J&W DB-WAX column fitted to an Agilent 6850/5975 GC/MS, whereas quantitative investigation used an Agilent J&W CP-Chirasil-Dex CB GC column. Published by the Pharmaceutical Society of Japan.

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