

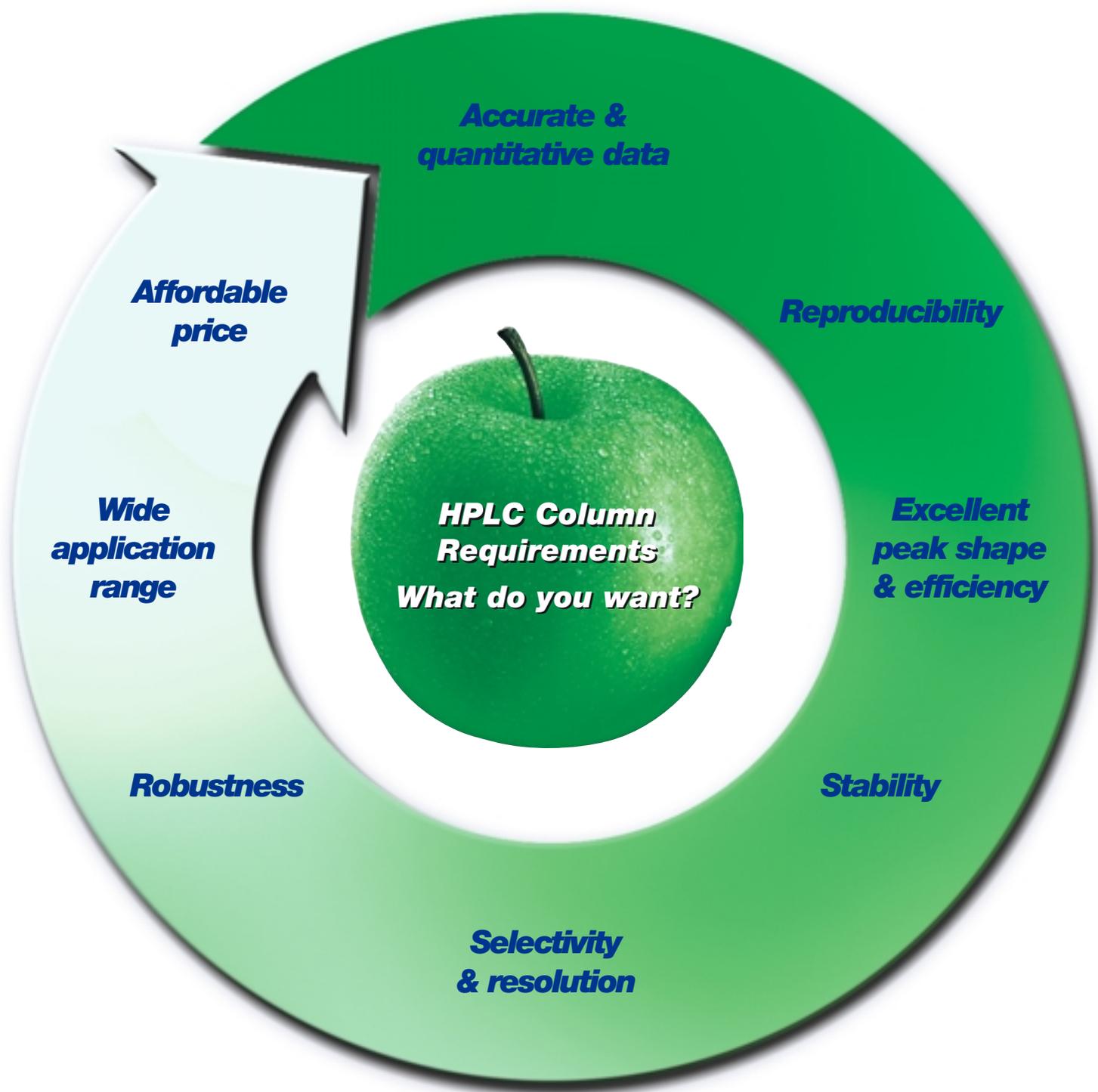
Genesis[®]
The new wisdom in HPLC

**Reliable &
reproducible
performance
every time -
Guaranteed**



design: Mack Strop t: 029 2049 0722

JONESCHROMATOGRAPHY
a world apart in separation



Genesis[®]

The new wisdom in HPLC

Genesis is a new-generation line of ultra-pure silica-based HPLC columns providing you with accurate and reliable data. These HPLC columns give you unparalleled reliability, a reduced cost per analysis and are suitable for all your application requirements. Genesis columns ensure that your work is complete and compliant, giving you total peace of mind

Peace of mind - Accurate and quantitative data

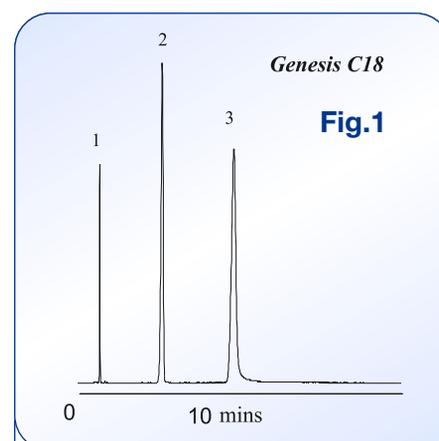
HPLC is a quantitative technique and your requirement for accurate, quantitative data is paramount. Not all materials will deliver this accuracy.

Free, acidic, silanol groups on the silica surface of the bonded phase can cause peak tailing and adsorption with basic analytes, leading to reduced quantitation.

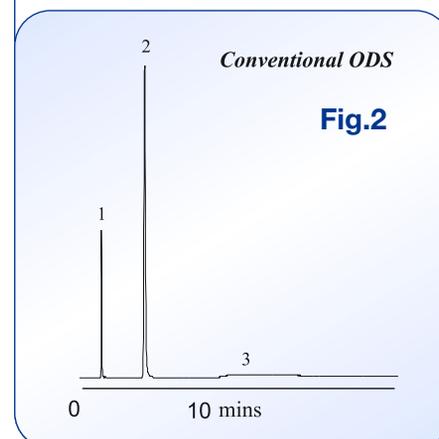
Genesis spherical silica possesses a uniform, fully hydroxylated surface with an absence of acidic groups resulting in accurate, quantitative data.

Additionally, surface bound metals, such as aluminium and iron, can behave as Lewis acids causing unwanted retention of bases. Metals can also interfere by chelation and by influencing the acidity of neighbouring silanols leading to peak distortion, solute adsorption and reduced reproducibility and quantitation.

Genesis is an ultra-pure silica with a very low level of metal ions both on the surface and within the matrix of the particle. This ensures minimum interference with your analytes and maximum accuracy of analysis.



Test: Metals
Columns: 15 x 4.6mm
Mobile Phase: 25% MeCN / 75% 25mM Phosphate pH 7.2
Detection: UV at 230nm
Flow: 1.5ml / min
Temperature: 40°C
Analytes: 1. Uracil
2. 2,7-Dihydroxynaphthalene
3. 2,3-Dihydroxynaphthalene



Reproducible performance every time and quality guaranteed

Reproducibility is a critical factor in QC, especially for routine assays. Genesis materials are manufactured by Jones Chromatography Ltd and have been in production for over 7 years. They have an enviable reputation in the field and Fig.3, displaying batches over a 5 year manufacturing period, demonstrates this aspect.

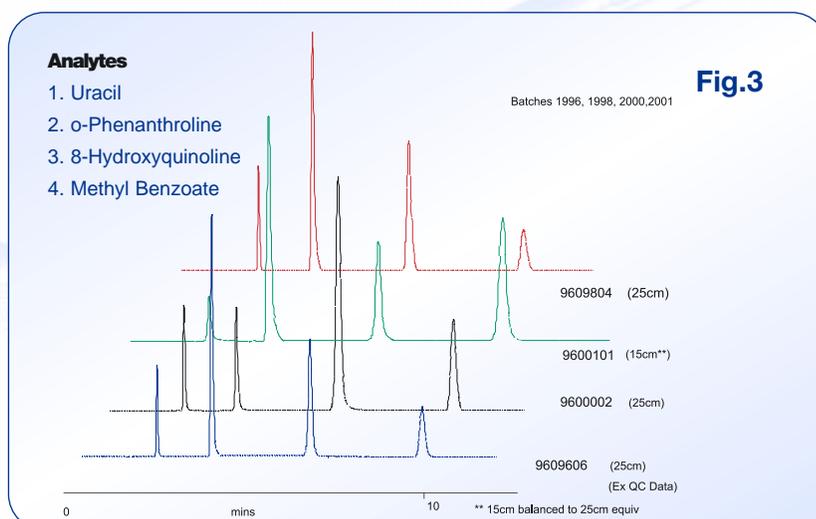
The Genesis line of columns and materials is manufactured and quality assured under the BS EN ISO 9002 quality system. Over 33 physical and chromatographic parameters are measured for the silica and a further 30 plus parameters are measured for each of the bonded phases. This ensures reliable and reproducible performance every time. Naturally, each column is fully tested and certified and is supplied with its own QC test certificate.

Excellent peak shape and efficiency

Genesis has a 4 μ particle size which it is generally agreed gives the optimum performance in terms of column efficiency and back-pressure. The inert surface and low metal levels ensure excellent peak shape for a wide range of analytes.

For additional performance, Genesis is available in a 3 μ particle size. These materials are best utilized in the short Lightning columns for LC-MS and Fast-LC or as high resolution columns.

4 μ Genesis C18
Excellent
batch-to-batch
reproducibility



Extended column lifetime and lower cost per analysis through enhanced stability

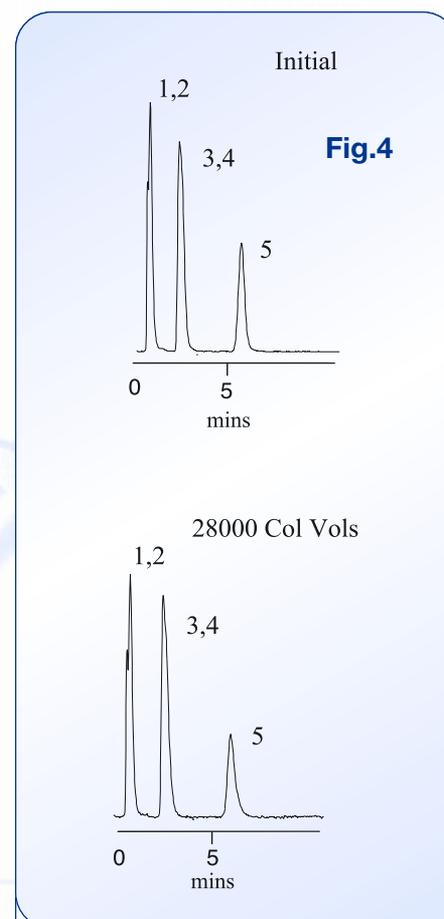
Genesis silica and bonded phases are stable throughout a wide range of pH leading to longer column lifetimes and reduced analysis costs. This stability also allows method development over a wider pH range to improve peak resolution.

To ensure a high stability at low pH, the use of a labile TMS-type end-capping agent is avoided and a capping agent of enhanced stability is used.

Stability at high pH is assured by the high surface coverage and exhaustive bonding and end-capping. These advanced bonding techniques for Genesis silica allow an operational range of up to pH 10 for alkyl phases.

The chromatograms opposite show the stability of a Genesis 300 C18 column purged at 60°C with a high aqueous mobile phase consisting of 10% acetonitrile/90% water containing 0.5% TFA, pH 1.3. Note, not only that there is no change in the retention time for toluene indicating no loss of carbon, but the pyridine retention time is low and unchanged and the pyridine peak shape remains good throughout the test. This indicates that there has been no generation of silanols, which would have resulted from a loss of bonded phase.

Genesis materials are also available in guard column format thereby further increasing the lifetime of your analytical column.



Genesis Stability

Conditions

Material: 4 μ Genesis 300 C18

Column: 33 x 3.0mm

Mobile Phase: 30% MeCN/Water

Purge: 10% Me CN/0.5% TFA pH 1.3

Temperature: 60°C

Analytes:
1. Uracil
2. Pyridine
3. Acetophenone
4. Methyl Benzoate
5. Toluene

Enhanced resolution and selectivity

The high column efficiency and symmetrical peaks coupled with good selectivity give you a range of columns offering excellent resolution.

The chromatograms in Fig.5 show the selectivity differences for 5 phases with a series of contraceptive steroid drugs.

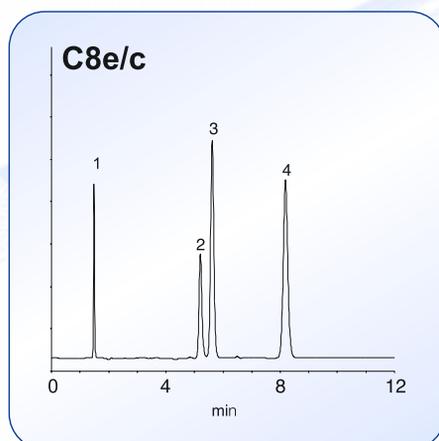
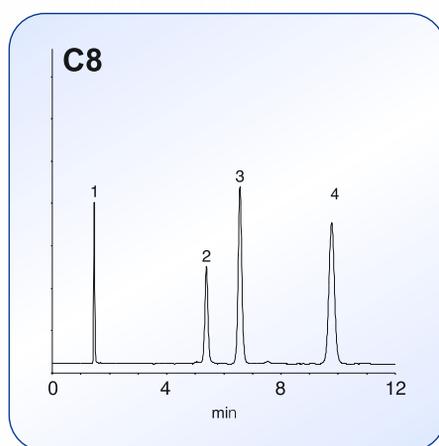
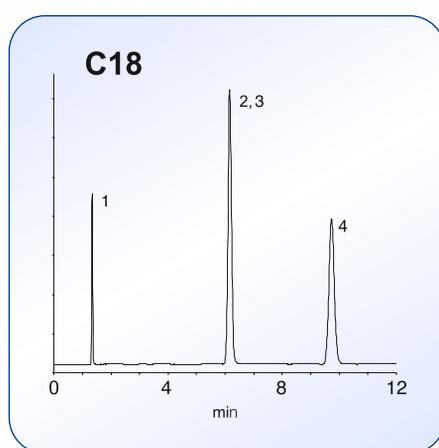
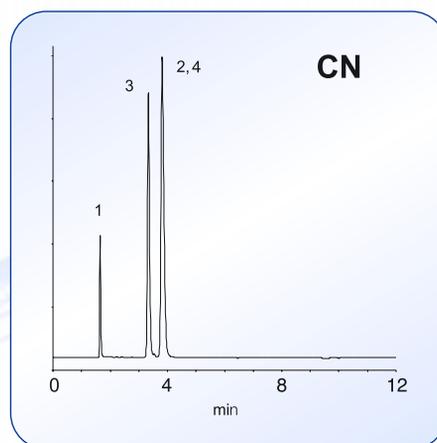
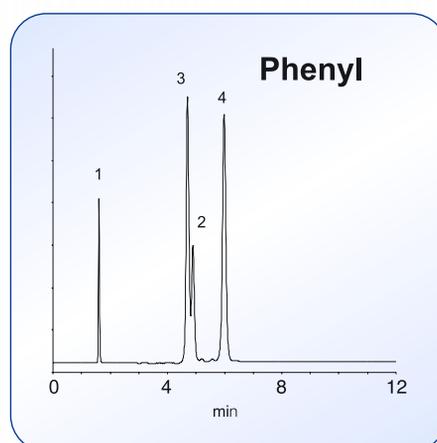


Fig.5



Chromatographic Conditions

Columns: Genesis 120Å 4µ, 150 x 4.6mm
Mobile Phase: 50% MeCN/Water
Flow Rate: 1.00 ml/min
Detection: UV at 225nm
Temperature: Ambient
Sample: Contraceptive drugs
1. Uracil
2. Ethynylestradiol
3. Norethindrone
4. Norgestrel

Excellent robustness - Remove the hassle factor of choosing columns

Jones Chromatography Ltd. has over 25 years of column packing experience. When combined with stable Genesis materials and state-of-the-art Finesse hardware, the result is robust, long-lasting columns every time - removing the hassle factor of choosing columns.

Wide application range

The presence of an inert, high purity silica surface and the use of advanced bonding techniques produces a range of homogeneous bonded phases with high coverage and a minimum of adverse secondary activity towards acids and bases. This allows the assay of acidic, neutral and basic analytes in the same mixture, improving lab efficiency and saving time, as shown in Fig.6.

Genesis is a family of complementary columns with different selectivities to suit different applications. This range of phases, coupled with a very wide range of hardware configurations, means that there is a Genesis column to suit every application.

And all this at a price you can afford

**Please see the accompanying
price list.**

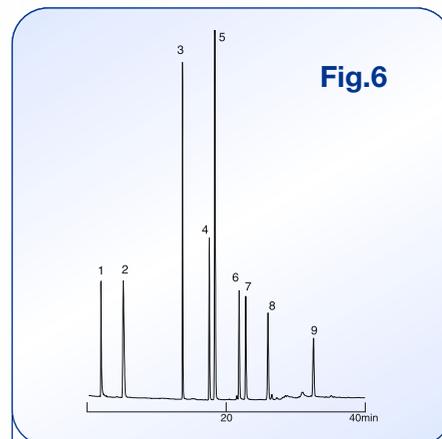


Fig.6

Separation Conditions

Column: 4µ Genesis C18 150mm x 4.6mm
Flow Rate: 1ml/min
Mobile Phase: A = Water + 0.1% H₃PO₄
B = MeCN + 0.1% H₃PO₄

Gradient:

Time	%A	%B
0	95	5
5	95	5
40	0	100
45	0	100
45.1	95	5
50	95	5

Detection:

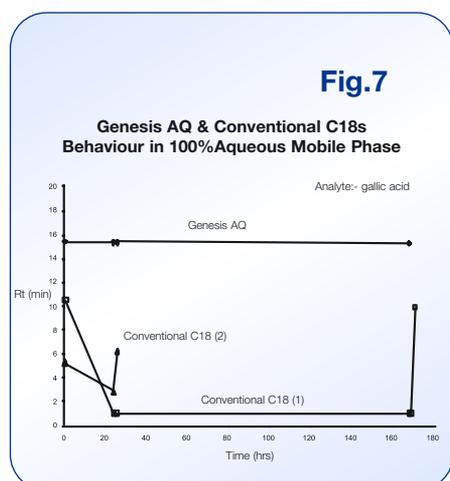
UV at 215nm

Analytes:

1. Pyridine
2. Benzylamine
3. N-acetylprocainamide HCl
4. Benzyl alcohol
5. Phenol
6. 4-Nitrobenzoic acid
7. 2,3-Dihydroxynaphthalene
8. 4-Chlorocinnamic acid
9. Phenyl ether

Genesis AQ - Separation of hydrophilic analytes using high aqueous mobile phases

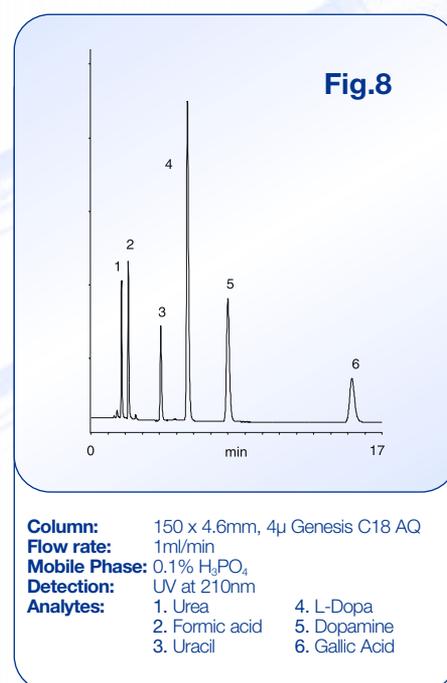
Genesis AQ is an ultra-pure, inert phase for the analysis of hydrophilic compounds. It offers fast equilibration times with high aqueous mobile phases and stable retention times. This leads to a fast, reliable and robust assay.



Genesis AQ can be used in up to 100% aqueous mobile phases without the ligand folding or non-wetting of traditional long chain, aliphatic stationary phases such as C18. This effect leads to a reduction in analyte retention time and often poor peak shape. Fig.7 shows this effect for two conventional C18 columns prone to this effect compared to the “inert” Genesis AQ.

Genesis AQ is a very stable product - it does not contain a polar embedded group but has an optimum ratio of C18 and short chains (not TMS) and neutral polar surface groups.

Retention with Genesis AQ is greater for polar solutes but lower for non-polar compounds compared to Genesis C18. Note in Fig 8 that uracil, a typical C18 unretained peak, is well retained on the AQ phase and that acids and bases give good peak shape.



Genesis 300 - Peptides and Proteins

Genesis 300 is a range of 300Å HPLC columns for peptide/protein and PNA analysis. The uniform pore distribution and absence of small pores allow unrestricted peptide rotation that will reduce band broadening. The resulting increase in peak efficiency and symmetry and reduction in peak volume leads to improved resolution and higher yields of collected material.

Genesis 300 columns can separate very small differences in peptide sequences for both peptides and polypeptides/proteins.

Genesis 300 and 120 materials are available to special order in PEEK lined columns with PEEK frits, for the assay of metal sensitive analytes. Standard Genesis 300 columns are supplied with titanium/PEEK cap/frits as standard.

Three reversed phase materials are available which separate on the basis of hydrophobicity.

Choice of phase

Sample	300Å C18	300Å C4	300Å CN	120Å, C18, C8e/c
1-10 aa residues				■
10-50 aa residues	■			
>50 aa residues		■		
Hydrophobic		■		
Hydrophilic	■		■	

Genesis Prep - Preparative LC

Genesis Prep 120Å materials are designed for high performance preparative and process applications and are available in 7µ and 15µ particle sizes. The inertness and purity levels are the same as the analytical product; same level of de-activation, high purity, and high stability. Genesis Prep produces symmetrical peaks without the addition of modifiers or additives giving you:

- Increased purity
- Increased sample throughput
- Increased product yield
- Simplified product purification

The materials are available in columns from 4.6mm id scout columns to 150mm id process cartridges complete with guard columns as required (See the Prep and Process LC brochure for further details). Genesis 300 C18 and C4 phases are also available in a 7µ particle size for protein preparative work and the 15µ, 120Å products are available as bulk materials.

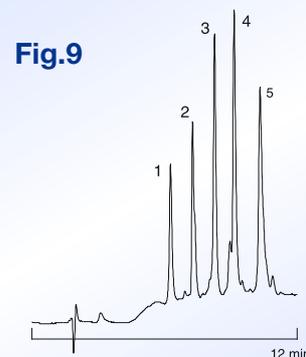


Fig.9

Column: 4µ Genesis 300 C18
150 x 4.6mm
Flow Rate: 1ml/min
Mobile Phase: A = Water + 0.08% TFA
B = Acetonitrile + 0.08% TFA
Gradient: 20 - 95% B in 20min
Detection: UV at 214nm
Analytes: 1. Ribonuclease 4. Lactalbumin
2. Insulin 5. Carbonic Anhydrase
3. Lysozyme

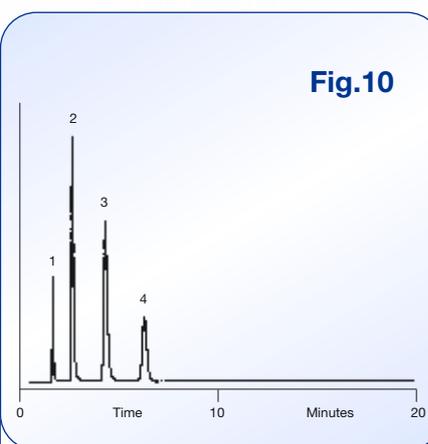


Fig.10

Column: 15µ Genesis C18 150 x 10mm
Flow Rate: 5ml/min
Mobile Phase: 50:50 Acetonitrile/0.02M K₂HPO₄ buffer pH=7.5
Detection: UV at 254nm
Analytes: 1. Uracil
2. 9, 10 Phenanthroline
3. 8-Hydroxyquinoline
4. Methyl Benzoate

Genesis Speciality Columns

Genesis speciality columns give you added confidence for a range of specific, important assays. All columns are conditioned and tested with a relevant test mix prior to delivery so that they are ready-to-use.

Genesis CN-TCA - Tricyclic antidepressants

Genesis CN-TCA columns have been designed specifically for the separation of tricyclic antidepressants. The column is pre-conditioned and all columns are tested with an 8 TCA test mix prior to sale. The chromatogram opposite, Fig.11, was generated after 500 hours of continuous running to demonstrate the stability of the column.

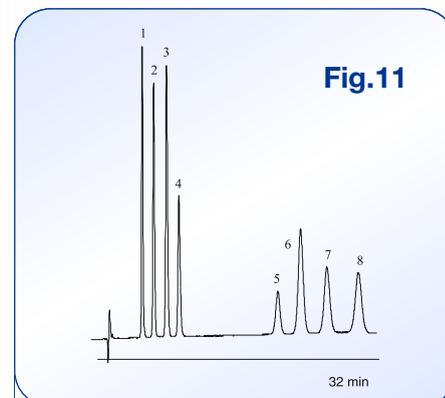


Fig.11

Column: 4 μ Genesis CN - TCA 150 x 4.6mm
Flow Rate: 1ml/min
Mobile Phase: 90% MeCN/10% 3mM K₂H Phosphate pH7
Detection: UV at 215nm
Analytes: 1. Trimipramine 5. Nordoxepin
 2. Doxepin 6. Nortriptyline
 3. Amitriptyline 7. Desipramine
 4. Imipramine 8. Protriptyline

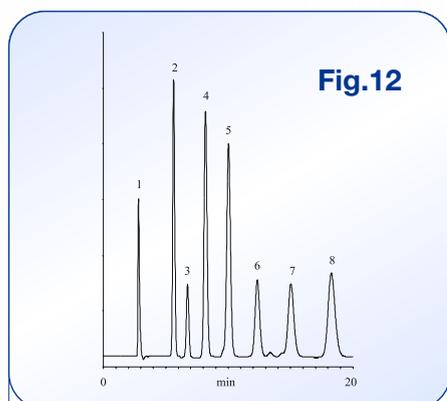


Fig.12

Column: 4 μ Genesis Carbohydrate 250 x 4.6mm
Flow rate: 1ml/min
Mobile Phase: 60% MeCN/Water
Detection: RI
Analytes: 1. Solvent Front 5. Maltotetraose
 2. Glucose 6. Maltopentaose
 3. Maltose 7. Maltohexaose
 4. Maltotriose 8. Maltoheptaose

Genesis Carbohydrate - Carbohydrates

Genesis Carbohydrate is a special 4 μ amino phase specifically for the separation of sugars. The column is also very useful for the analysis of sugar alcohols and, as shown in Fig.12, sugar polymers. Acetonitrile/water mobile phases are again used, reducing the water content to increase retention.

Genesis Petro XL - Diesel and other hydrocarbon fuels

Genesis Petro XL is a special 3 μ amino based phase for the group analysis of diesel and other hydrocarbon fuels. A typical application separates aliphatics, mono-, di-, and poly-aromatics, as shown in Fig.13.

The column will differentiate various types of fuel, for instance standard and city diesel. Since this is a normal phase application, 2 x 25cm columns may be used in series, if required, without undue backpressure being generated.

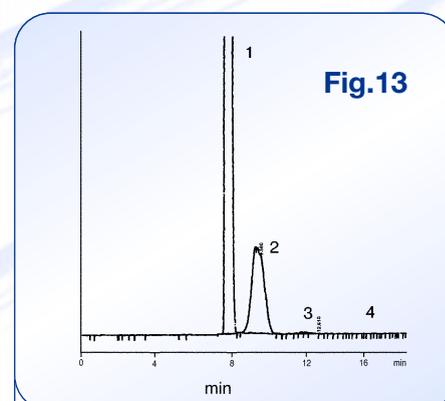


Fig.13

Column: 2 x Genesis Petro XL 3 μ 250 x 4.6mm columns in series
Flow rate: 1ml/min
Mobile Phase: Hexane
Detection: RI
Analytes: 1. Aliphatics 3. Di-aromatics
 2. Mono-aromatics 4. Poly-aromatics
 Courtesy of Cecilia Patriksson, Scanraff AB, Sweden

Genesis Lightning - LC-MS

Lightning is the name given to all Genesis tested analytical columns, 10mm to 100mm long. They are ideal for LC-MS and fast LC applications.

Genesis Microbore and Capillary LC - High Sensitivity

Genesis materials are available in 1mm id microbore and 150µm and 320µm capillary LC columns for high sensitivity applications.

The microbore columns are constructed in stainless steel for robustness with special zero-dead-volume threaded-end 1/16th fittings. Microbore columns are available packed with both 120Å and 300Å Genesis 3µ and 4µ packings.

Capillary LC columns are at the cutting edge of HPLC column technology and combined with ultra-pure, inert Genesis packings produce a formidable column combination, particularly in the area of proteomics.

- Very high sensitivity gradient and isocratic analyses.
- High performance.
- Robust construction.
- Easy to use.
- Columns may be backflushed.
- Genesis 120Å and 300Å packings.
- LC-MS applications.
- Major application areas include Drug Discovery/Combinatorial Chemistry, Proteomics, Neuro- and Bio-Chemistry.
- Standard products at present are 150µm and 320µm id and 50mm and 100mm long.
- Coming soon - 300µm and 500µm id columns.

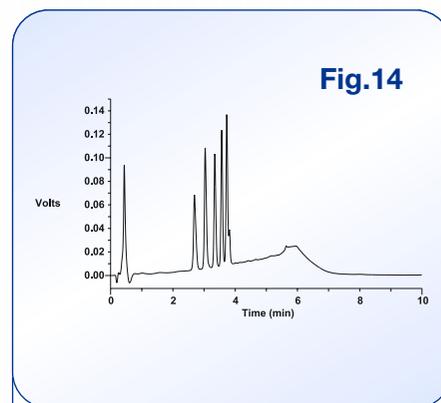


Fig.14

Column: 4µ Genesis C18 50 x 1.0mm
Mobile Phase: A = 5% ACN/aq. 0.02% TFA + 0.1% HAC
 B = 60% ACN/aq. 0.02% TFA + 0.1% HAC Gradient A to B over 5 mins
Flow Rate: 50µl/min
Detection: UV at 214nm
Sample: 1. [Val⁴, Ile⁷] - Angiotensin III
 2. [Val⁴] - Angiotensin III
 3. Angiotensin III
 4. [Val⁵] - Angiotensin III
 5. Human Angiotensin I (Hypertensin)

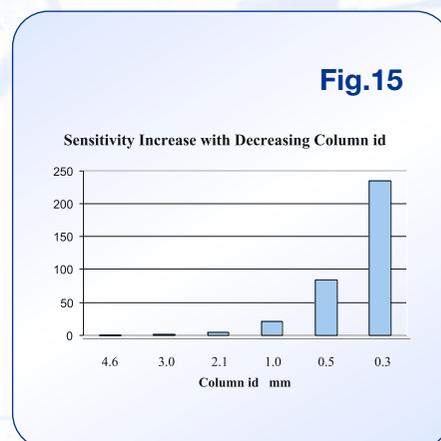


Fig.15

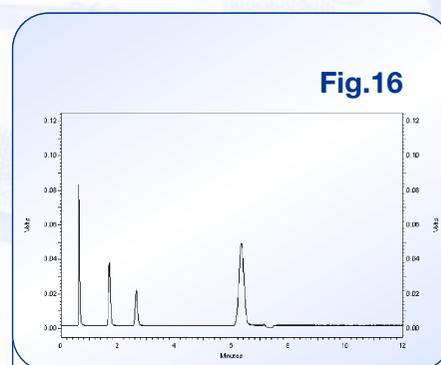


Fig.16

Column: 3µ Genesis C18
Size: 100mm x 320µm
Mobile Phase: 50% Acetonitrile/water
Flow Rate: 2µl/min
Detection: UV at 210nm, 0.2AUFS/0.1 sec
Injection: 60nl
Analytes: 1. Thiourea
 2. Dimethylphthalate
 3. Anisole
 4. Naphthalene

Method development and validation made easy

Genesis Kits

Four kits are available to assist busy development labs to select and validate HPLC columns.

- **Method Development Kits**

Genesis method development kits are designed for the optimisation of column selectivity and resolution. They consist of 3 columns, typically 150mm x 4.6mm, packed with different Genesis chemistries of your choice.

- **Method Validation Kits**

These kits consist of 3 columns of user selected chemistry and geometry. They comprise two different batches of packing material so that injection to injection, column to column and batch to batch variations can be established.

- **Phase Screening Kits**

These affordable kits allow selectivity changes with change in phase to be rapidly determined. The 20mm cartridge columns give run times typically less than 2 minutes and by means of the supplied s/w disk, predictions are made regarding the peak resolution expected for 150mm and 250mm columns. Both reversed phase and normal phase kits, with or without holders, are available.

- **CombiChem Kits**

These kits comprise three 5cm long columns, analytical 4.6mm id, 10mm id and 22.5mm id for combinatorial or other semi-preparative applications. These fast columns give high yields and rapid throughput.



Save money!

The kits save you money! They are priced lower than the individual components.

Applications

The following is a selection of applications to illustrate the broad application range of Genesis columns. An applications CD is available from Jones Chromatography, or your local distributor, which currently contains almost 100 applications in the pharmaceutical, biomedical, environmental, food and other areas. Please call for details.

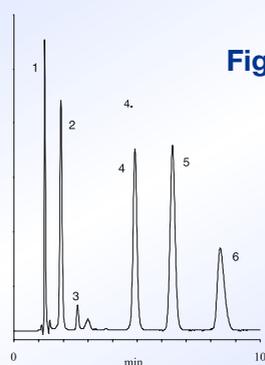


Fig.19

Column: 4 μ Genesis C18 100 x 4.6mm
Flow Rate: 1ml/min
Mobile Phase: 20% MeOH/ KH_2PO_4 buffer 25 mM pH 3.0
Detection: UV at 254nm

Analytes:
1. Uracil
2. Amoxicillin
3. Unknown
4. Cefaclor
5. Cefalexin
6. Ampicillin

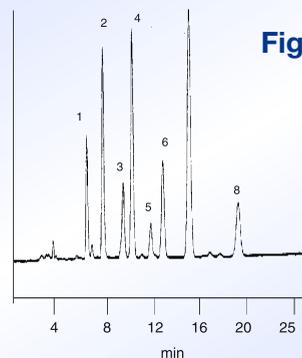


Fig.20

Column: Genesis Sil 4 μ 250 x 4.6mm
Flow rate: 1.5 ml/min
Mobile Phase: 96% Hexane/4% 1,4-Dioxan
Detection: Fluorometric @ 294nm (exc) and 326nm (emission)

Temp: Ambient
Analytes:
1. a-tocopherol
2. a-tocotrienol
3. B-tocopherol
4. Y-tocopherol
5. B-tocotrienol
6. Y-tocotrienol
7. d-tocopherol
8. d-tocotrienol

Data courtesy of Afaf Kamal-Eldin, Swedish University of Agriculture, Uppsala, Sweden.

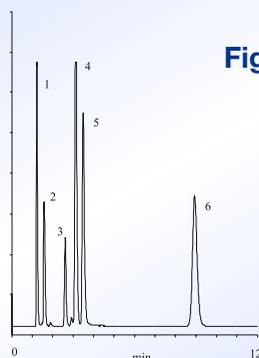


Fig.21

Column: 4 μ Genesis C8e/c 100 x 4.6mm
Flow rate: 1ml/min
Mobile Phase: 20% MeCN/Sodium acetate buffer, 25 mM pH 5.5
Detection: UV at 254nm

Analytes:
1. Uracil
2. Theophylline
3. Impurity/unknown
4. Hydrochlorothiazide
5. Triamterene
6. Furosemide

Genesis – Range of Phases

Silica, 4μ, 7μ, 15μ, 120Å

High purity inert 120Å silica.

C18, 3μ, 4μ, 7μ, 15μ, 120Å

Fully bonded octadecyl phases, end-capped with an enhanced-stability reagent.

C8, 3μ, 4μ, 7μ, 15μ, 120Å

Exhaustively bonded, non-endcapped octyl material.

C8 e/c, 3μ, 4μ, 7μ, 15μ, 120Å

Octyl phase prepared using double bonding technology followed by end-capping with a reagent of enhanced stability.

We recommend the end-capped C8 for higher pH and the non-end-capped C8 for lower pH applications although peptide separations typically benefit from the use of a fully end-capped material.

C4, 4μ, 120Å

An end-capped t-butyl phase for medium polarity analytes and reduced retention, reversed-phase applications.

AQ, 4μ, 7μ, 120Å

A C18 phase for the separation of hydrophilic analytes using up to 100% aqueous mobile phases.

CN, 3μ, 4μ 120Å

A fully end-capped cyanopropyl phase which provides excellent efficiency as well as having excellent stability to temperature and pH. Genesis CN can be used in both normal and reversed phase modes.

NH2, 3μ, 4μ 120Å

An amino-propyl phase for normal, reversed-phase and weak anion exchange applications.

Phenyl, 4μ 120Å

A fully end-capped phenyl phase which offers selectivity differences to the alkyl and cyano reversed phases and the cyano, amino and silica normal phases.

C18, 4μ, 7μ, 300Å

A 300Å exhaustively bonded and end-capped octadecyl material for the analysis of peptides, proteins and polynucleotides.

C4, 4μ, 7μ, 300Å

A 300Å exhaustively bonded and end-capped t-butyl material for the analysis of proteins and polypeptides.

CN, 4μ 300Å

A 300Å fully end-capped cyanopropyl phase which offers selectivity differences to the C18 and C4 phases in peptide and protein applications.

Phases in additional particle sizes are available to special order - contact Customer Services for details.

Genesis Specifications

Material, Genesis	Shape	Particle Size	Surface Area, m ² /gm	Pore Size, Å	% Carbon	Coverage, umoles/m ²
Silica	Sph	4μ, 7μ, 15μ	300	120	-	-
C18	Sph	3μ, 4μ, 7μ, 15μ	300	120	18	3.87
C8	Sph	3μ, 4μ, 7μ, 15μ	300	120	11	3.68
C8e/c	Sph	3μ, 4μ, 7μ, 15μ	300	120	11	3.85
C4	Sph	4μ	300	120	6.3	3.48
CN	Sph	3μ, 4μ	300	120	7	3.85
NH2	Sph	3μ, 4μ	300	120	3.5	3.5
Phenyl	Sph	4μ	300	120	9.4	3.95
AQ	Sph	4μ, 7μ,	300	120	15	4.03
C18	Sph	4μ, 7μ,	120	300	10	3.85
C4	Sph	4μ, 7μ,	120	300	3	4.80
CN	Sph	4μ	120	300	3.3	4.30

Range of Genesis Columns

Analytical Columns

- 3 μ /4 μ particle sizes, all standard phases.
- Finesse style hardware as standard in column and cartridge format (latter excludes end fittings).
- 3.3cm, 5cm, 10cm, 15cm, 20cm, 25cm lengths.
- 1cm and 2cm cartridges (holder required), as tested cartridges and untested guard cartridges.
- Column internal diameters, 4.6mm, 4.0mm, 3.0mm, 2.1mm. (4.0mm and 3.0mm not available in 20cm lengths)
- Other lengths, 3.5cm to 30cm available in compression hardware to special order.
- PEEK lined columns also available.

Lightning Columns

- Genesis tested columns 1cm to 10cm in length for LC-MS and fast LC applications.

Microbore Columns

- 3 μ /4 μ particle sizes, all standard phases.
- 5cm, 10cm and 15cm lengths plus 1cm guards.
- 1mm id.

Capillary columns

- 3 μ 120Å C18/4 μ 300Å C18 as standard, other 3 μ /4 μ phases to order.
- 5cm and 10cm lengths as standard
- 150 μ m and 320 μ m ids - additional sizes to follow.

Semi-Prep Columns

- 3 μ 120Å (7mm id only), 4 μ 120/300Å, 7 μ 120/300Å and 15 μ 120Å particle sizes.
- All standard phases (7 μ and 15 μ 120 C18, C8 and C8e/c, 7 μ 300 C18 and C4).
- 5cm (6cm for 10mm id), 10cm, 15cm and 25cm lengths as standard, others to special order.
- 7mm, 10mm id - compression columns and 22.5mm id flange design columns.

Prep and Process Columns

- JCL/CEDI cartridge design, holder required (50mm or 50/100/150mm).
- 7 μ /15 μ : 120Å C18, 120Å C8, 120Å C8e/c and 7 μ : 300Å C18, 300Å C4.
- 5cm, 20cm and 30cm bed lengths
- 50mm, 100mm and 150mm id (latter 15 μ only).

Guard Columns

- Full range of guard columns available to suit all columns.
- 10mm and 20mm cartridges with stand-alone or integral holders for analytical columns.

Ordering Information

Full part number and pricing details are given on the accompanying price list, additional copies of which are available from Jones Chromatography Ltd or your local distributor. A very wide range of column configurations is available to suit almost every application.

Full address and contact numbers are given on the back page. If you have any queries, please contact Jones Chromatography Ltd.

Customer Services:

Tel: +44 (0)1443 811811

Fax: +44 (0)1443 816552

e-mail: hplc@jones-chrom.co.uk

Web: www.jones-chrom.co.uk

or your local distributor.

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Jones Chromatography Ltd

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46000 Petaling Jaya, Selangor, Malaysia

Tel: (603) 7783 1357/59

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Prices and specification subject to change without notification.