SES GmbH - Analytical Systems - Friedhofstr. 7-9 - 55234 Bechenheim / Germany

IATROSCAN™ MK-6/6s

TLC-FID / FPD Dual Detector System

IATROSCAN

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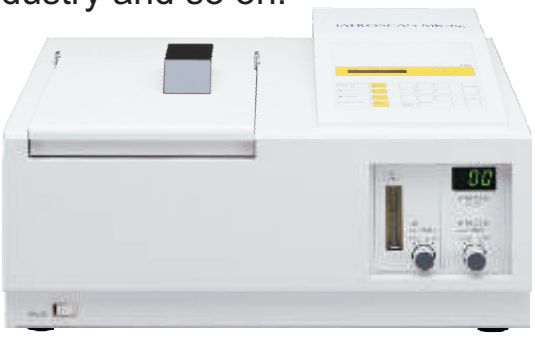
We want to introduce the TLC/FID Analyzing System IATROSCAN MK-6

The analysis of high boiling organic substances may cause Problems in many cases. The IATROSCAN MK-6s offers with the combination of thin layer Chromatography and FID (MK-6 additional with FPD) interesting perspectives.

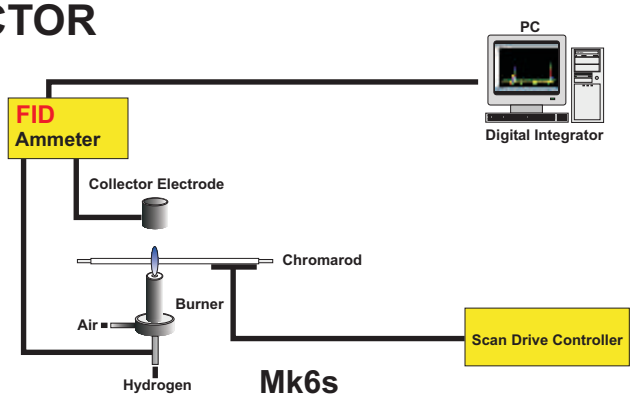
The MK-6 with the Flame Photometry Detector makes it possible to Analyze also Phosphorus and Sulphur. The TLC/FID(-FPD) Analytical System IATROSCAN MK-6(s) can be used in many different application fields like Plant Breeding, Forestry, Fishery, Crude oil and carbon industry, carbon products, biochemistry, biotechnology, pharmaceutical industry, environmental pollution, food industry and so on.



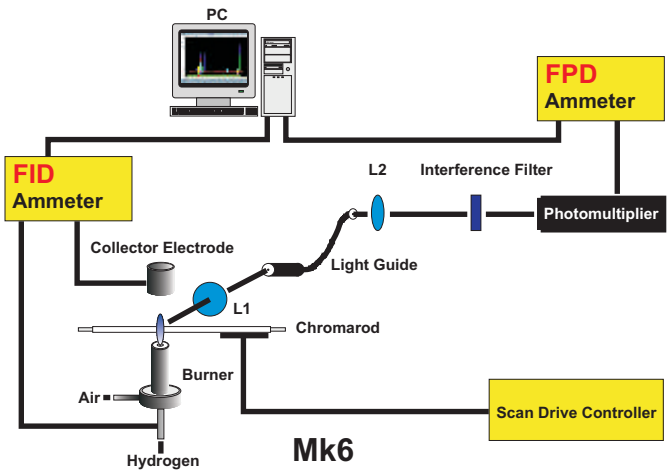
The advantages of the IATROSCAN System are:
- work with up to 10 Chromarods at the same time,
- many application fields,
- the Chromarods are reusable up to 100 times,
- 20-30 minutes analyzing time (depending on method)

THE IATROSCAN MK-6(S) ANALYSING SYSTEM FOR TLC WITH FID OR FPD DETECTOR

The Separation is made with the TLC Method on so called ChromarodsÚ and the Detection with a Flame Ionization Detector (FID). With an additional FP-Detector it is possible to analyze sulphur and phosphorus, too (MK-6). The Analysis is made with different complementary accessories.



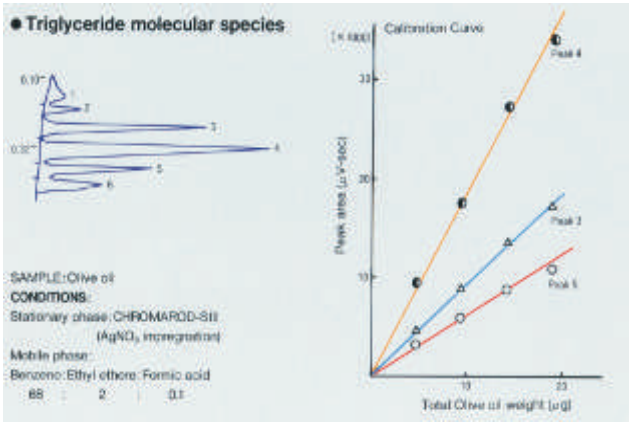
The spotting of the sample is made with a specially developed Application System (Autospotter or Full-Automatic-Sample Spotter) on the 10 Chromarods lying in the Rod Holder. The Chromarods are developed in a special Development Tank. After the separation of the substances the Holder is put in the IATROSCAN. The Chromarods are scanned through the Hydrogen flame. The collector, which is placed above the flame is generating an analogue signal, which is evaluated with a PC and the SES ChromStar* Software.

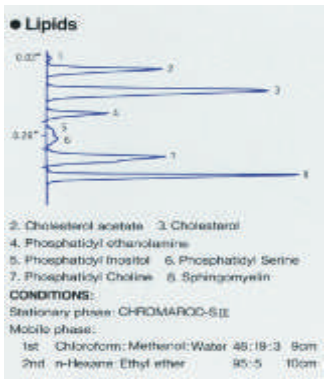


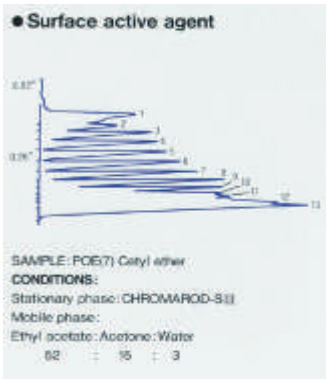
The TLC/FID Analytical System IATROSCAN MK-6(s) was developed for the Analyzing of organic Substances, which show no UV- Absorption and no Fluorescence, and give difficulties by analyzing with GC.

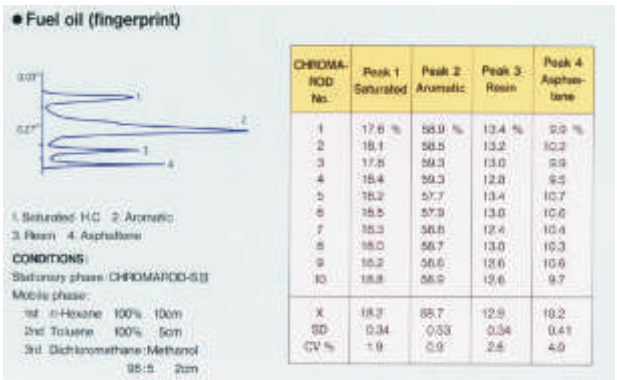
Examples of Applications

IATROSCAN can cover the whole range of organic compounds TLC analyses and is optimal especially for heavy oil type analysis, tracking organic synthetic reactions and so forth. It is also available with versatility for crude materials analyses under open athmosphere, which are difficult to be done by GC and/or LC. Furthermore, the sample spottet on the CHROMAROD can be simply quantified without development.



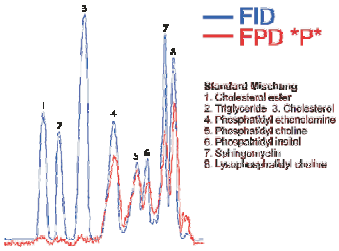




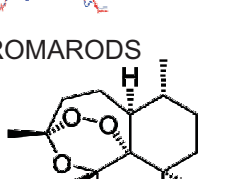


CHROMAROD No.	Peak 1 Saturated	Peak 2 Aromatic	Peak 3 Resin	Peak 4 Asphaltene
1	17.6 %	58.9 %	13.4 %	9.9 %
2	18.1	58.5	13.2	10.2
3	17.8	59.3	13.0	9.9
4	18.4	59.3	12.8	9.5
5	18.2	57.7	13.4	10.7
6	18.5	57.9	13.0	10.6
7	18.3	58.6	12.4	10.4
8	18.0	58.7	13.0	10.3
9	18.2	58.6	12.6	10.6
10	18.8	58.9	12.6	9.7
X	18.2	58.7	12.9	10.2
SD	0.34	0.53	0.34	0.41
CV %	1.9	0.9	2.6	4.0

IATROSCAN INSTRUMENT APPLICATION

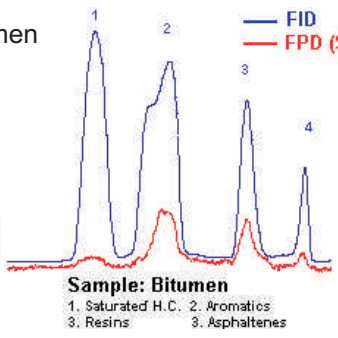


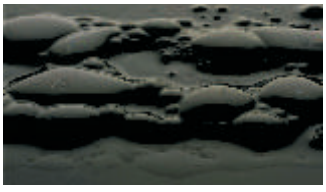
- No. 11 Analytical Patterns of heavy oil
- No. 12 Analysis of Glyceride Isomers by Boric acid CHROMARODS
- No. 13 Tracing of reaction with enzymatic Experimental reaction
- No. 14 Analysis of Serum Lipids
- No. 5 Analysis of Lipids, physiological samples
- No. 5.-II.Analysis of Lipids, general
- No. 16 Analysis of Triglyceride Molecular Species using silver nitrate Impregnated CHROMARODS
- No. 7 Precautions in Performing Analyses
- No. 18 Determination of the phosphatidylcholine content in egg yolk lecithin
- No. 9 Separation of the Isomers and derivatives
- No. 21 Analysis of surface activ agents
- No. 22 Lipids Analysis by Copper Sulphate impregnated CHROMARODS
- No. 23 Analysis of Lipids by the IATROSCAN (Marine Products)
- No. 24 Analysis of Polymer additives
- No. 20 Experimental analysis for infinitesimal components in the main Ingredients
- No. 25 Analyses of food additives



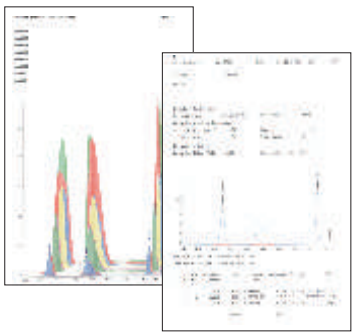
- Appendix III CHROMATOGRAMS
  DYE :Food Dye, Naphthol quinone and Azo dye
  Hormones: Pregnandiol Ginseng Saponine Liquid Crystal
  Capsaicine Cosmetic Cream Rubber Antioxidant Polymer

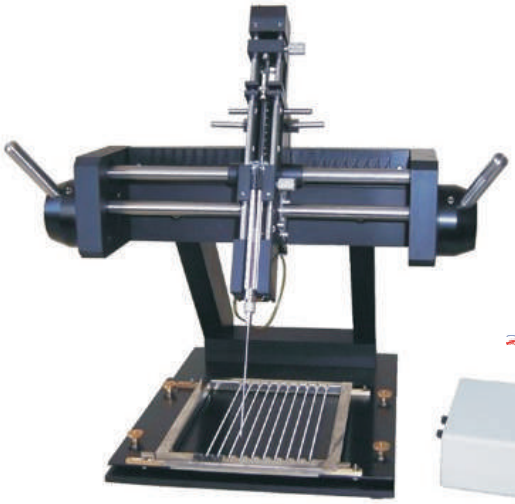
- Analysis of Bitumen

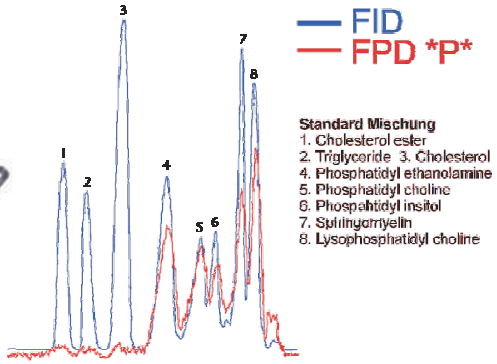




Procedure

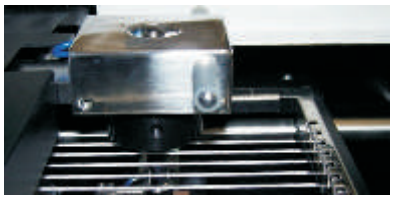






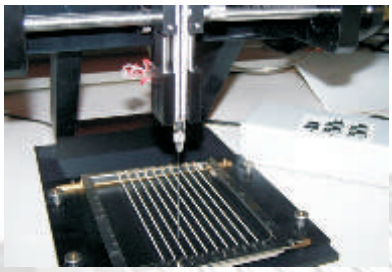
1. Blank Scan

The CHROMARODS can be cleaned and activated by the hydrogen flame trough the Blanc Scan on IATROSCAN.



2. Sample Spotting

The Sample can be spotted in different concentrations on the CHROMARODS by using the SES Spotter.



3. Seperation

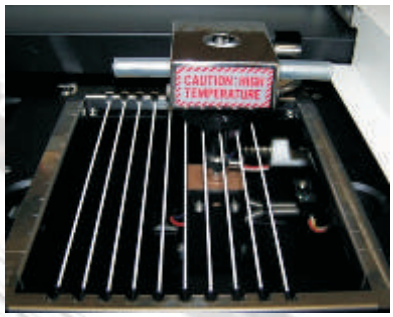
The components in the sample on the CHROMARDS are seperated trough development procedure in the Development Tanks DT-150

4. Solvent removal

After development, the development solvent absorbed on the CHROMARODS is removed.

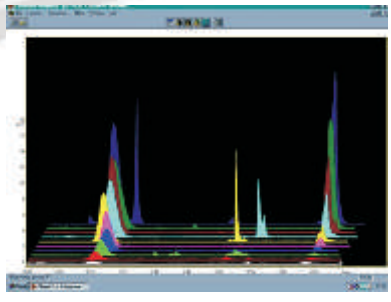
5. Measurement

After solvent removal, start measurement. Placed the CHROMARODS into the IATROSCAN.

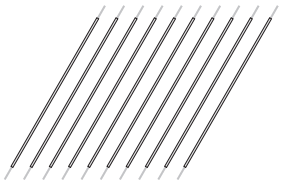


6. Data aquisitation

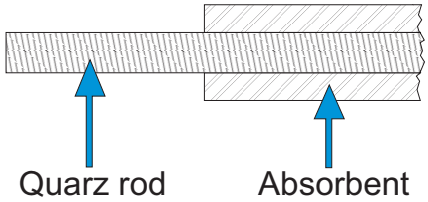
Start the IATROSCAN and the data aquisition in SES-ChromStar.



CHROMARODS™

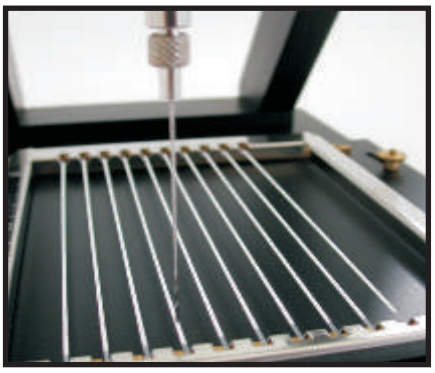


The CHROMAROD, developed exclusively for the IATROSCAN, is a thin layer in the form of thin quarz rod evenly applied and sintered inorganic binder and adsorbent on it. Usually the cleaning and activation of CHROMARODS can be used repeatedly. The CHORMARODS give excellent separability of components and exhibit stable reproducibility. Special types of thin-layers, such as those suitable for seperating triglycerides in accordance with their unsaturation degrees or glyceride isomers, can be easily prepared simply by immersing the rods in silver nitrate or boric acid solution respectively.



Semi-automatic Sample Spotter Model:

SES 3202 / IS-03



SES Model 3202 Autospotter for TLC/FID techniques is a new precision instrument specially developed for applying sample solution onto the sintered silica gel surface of a Chromarod. The smaller and more concentrated the sample spot, the better the resolution obtained after development of the Chromarod in a TLC chamber (3201).

The reproducibility of quantitative and qualitative analyses with the IATROSCAN is closely related to the accurate application of a known quantity of sample onto the surface of a Chromarod in the form of a micro spot.

With the "Autospotter" it is possible to apply between 0.020 and 10 micro liters of sample solution. The spotting is electronically controlled through a small external microprocessor module, with a precision of better than 0.5 %

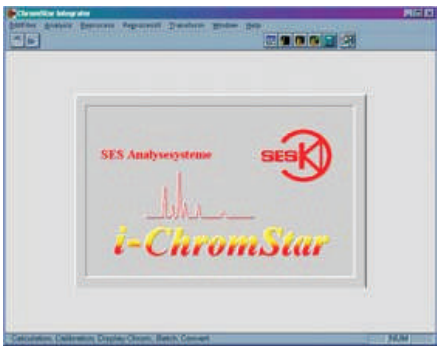
Features:

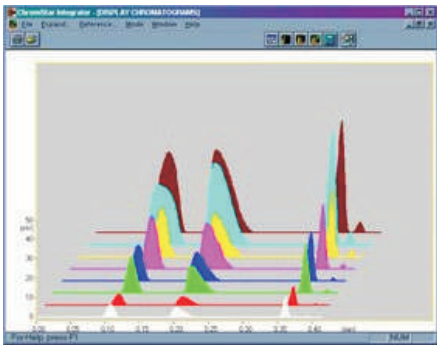
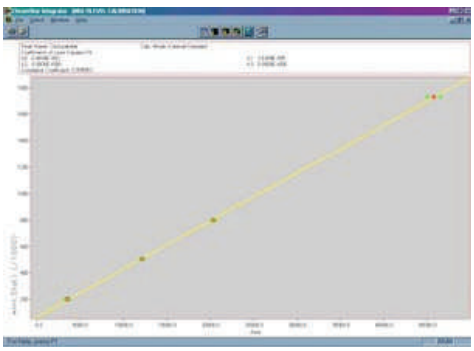
- Quantity of sample is digitally controlled by a stepping motor, driving a precision syringe.
- Accurate, automatic indexing of the syringe to the next sample application position.
- Automatic dispensing of sample when each indexed position is reached.
- Automatic control of 2 wash-cycles using the "Wash-Button"
- Precise selection of sample quantity by pre-selection of syringe piston stroke.
- Constant controlled speed of pick- up and discharge of sample quantity prevents the formation of gas bubbles in volatile eluents.
- The "Autospotter" can apply the sample in successive aliquots thus allowing the solvent to evaporate prior to dispensing the next measured sample. this avoids diffusion of the sample spot and prevents deterioration of resolution. In this way large amounts of sample can be applied on Chromarods to improve the sensitivity of analyses.

The "Autospotter" is a robust and reliable instrument that guarantees the precision and accuracy required in TLC/FID analysis. The compact control unit allows flexible usage to individual needs. A spring-controlled syringe reduces the pressure of the syringe-needle against the Chromarod surface to a minimum, so that the TLC-layer remains damage free. The "Autospotter" is delivered with a special frame to precisely align the position of Chromarods to the tip of the syringe.

SES-i-ChromStar

Chromatography Software System for Windows Pcs



Hardware

• High dynamic range:	1,2…10 Volt, interference < 0,5 µV with 100 Hz measuring interval, scanning rate 0.1 … 100 Hz
• Start/Stop- control:	external falling edge TTL or with keyboard
• Analogue/digital- converter USB Box:	Standard Version* supports only one channel with a USB Box. Full Version supports two channels with each USB Box.
• minimal requirements:	Dual Core CPU; mind. 2 MB RAM; 10 GB HD;

**Standard version, one channel SES-i-ChromStar special for use with IATROSCAN.*

Software

• Windows Software:	clearly arranged structure and a short training time, Color Printers or PDF Printer are recommeded.
• practical baseline, operations:	time, dependent Parameters, manual baseline, Baseline Subtraction, proximity functions
• extensive Chromatogram-treatment:	Addition/Subtraction/proportion with time shift smoothing by digital filter 1st and 2nd derivative
• GLP conformity:	3 access levels: supervisor, lab manager, user documentation conform to GLP
• 3-dimensional display:	up to 10 Chromatograms in one plot, offset, angle
• varied methods of calibration:	one-point-calibration, multi-level-calibration, percent-method, normalization, external-standard-method, internal-standard-method, external-standard-method with non linear regression, intern-standard-method with non linear regression.

- Chromatograms and reports can be transferred to other Windows-programs without problems
- optional software for gel-permeation-chromatography
- Sample table for use with auto sampler

Specifications

- Principle of Separation:	Thin layer Chromatography with the use of Chromarods (a special rod coated with a thin layer adsorbent)
- Detection:	MK-6: Hydrogen Flame Ionization Detector (FID) and Flame Photometer Detector (FPD) (Dual Detection), MK-6s: FID (Single Detection)
- Detection Time:	25, 30, 35, 40, 50, 60 sec. /scan
- Hydrogen flow monitor:	Electronic flow meter (digital Display)
- Air flow Monitor:	Air flow meter (float type)
- Chromarod Holder:	Available for loading 10 CHROMARODS
- Measuring modes:	Normal Scan / Blank Scan / Origin scan / Partial pyrolysis scan (PPS) / Manual PPS
- Power:	AC 100, 120, 220 & 240 V, 50/60 Hz
- Power Requirement:	~ 50 VA
- Temp. / Humidity:	10 ~ 35 °C / 20 ~ 80 RH
- Dimensions:	MK-6: ~ 520 x 430 x 265 mm, MK-6s ~ 520 x 430 x 260
- Weight:	MK-6: ~ 25 kg, MK-6s: ~ 23 kg

Available Accessories

- SES ChromStar (evaluating Software) with Integrator & PC
- Autospotter SES 3202 / 03
- Chromarods S-V
- Development Tank DT-150
- Storage Chamber
- Chromarod Viewer Panel
- Rod Dryer TK-8 only outside the EU
- SES Chromarod Dryer
- Chromarod Holder

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