

Analytix

Advances in Analytical Chemistry



High Purity Solvents

The increased sensitivity and lower detection limits of modern instrumental analysis demand the highest purity solvents available.

Riedel-de Haën has developed a range of High Purity Solvents for use in these applications.



E-CHROMASOLV® – for HPLC in the short wavelength region – far UV.

Also tested for fluorescence detection.

R-CHROMASOLV® – for routine HPLC.

P-CHROMASOLV® – for preparative liquid chromatography.

AMD-CHROMASOLV® – developed for AMD Technology

(Automated Multiple Development). This fully automated, flexible and versatile separation technique is used in thin layer chromatography.

Solvents for Chromatography

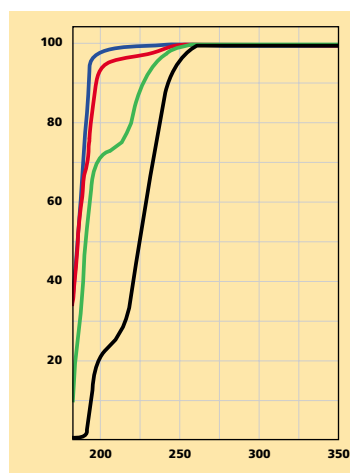
In High Performance Liquid Chromatography (HPLC), the quality and reproducibility of the separation depend not only on the properties of the stationary phase but also on the quality of the solvents used. The **CHROMASOLV®** solvent line offers guaranteed quality specially-tailored for chromatographic requirements, and excellent batch-to-batch consistency.

Additional quality grades have been designed for methods with different types of detection and for thin layer chromatography (figure 1).

G-CHROMASOLV® – super gradient grade, satisfying the most exacting requirements of gradient elution.

CHROMASOLV® – for HPLC, characterized by high UV transmittance, low non-volatile components, free acid and free alkali, and an exactly defined low water content.

Figure 1:
Quality grades are indicated for Acetonitrile



Acetonitrile

G-CHROMASOLV®
Product No. 34998

AMD-CHROMASOLV®
Product No. 34896

CHROMASOLV®
Product No. 34851

R-CHROMASOLV®
Product No. 34881

P-CHROMASOLV®
Product No. 34989

Contents:

Solvents for ...

- Chromatography
- Spectroscopy
- Residue Analysis
- Environmental Analysis

Figure 2:
IR-spectrum of
1,1,2-Trichloro-
trifluoroethane
(with different
path lengths)

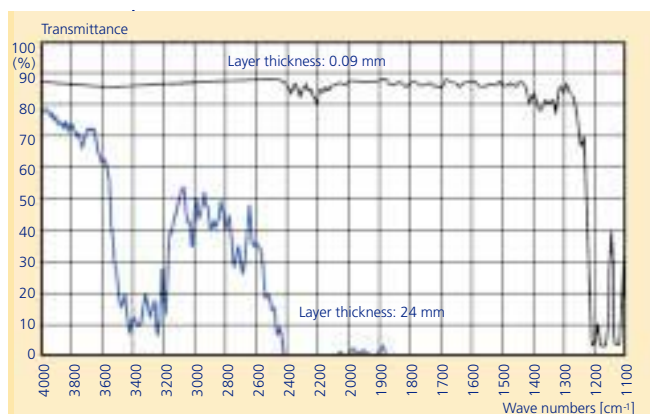


Figure 3:
Chromatogram
of n-Hexane
PESTANAL®

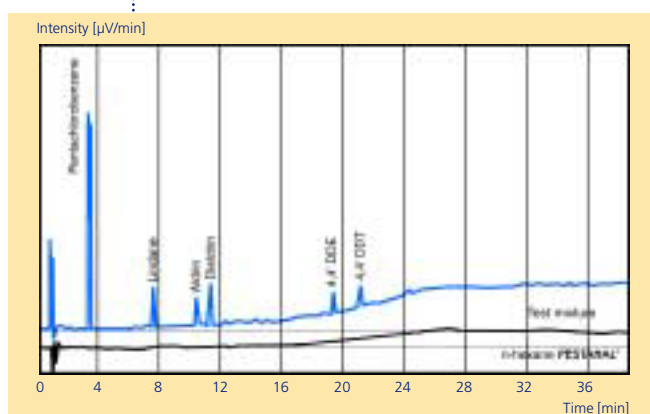
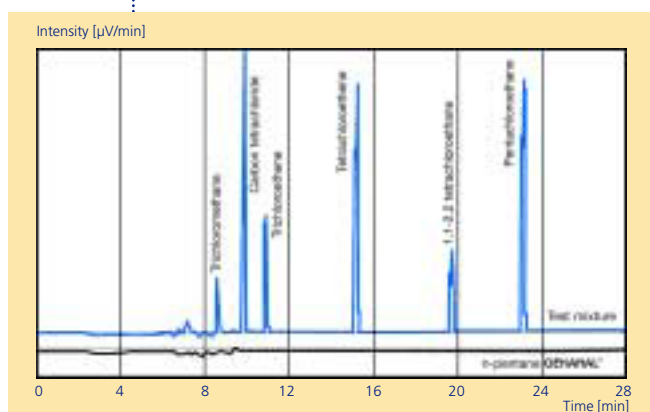


Figure 4:
Chromatogram
of n-Pentane
OEKANAL®



Solvents for Spectroscopy

The **SPECTRANAL**® solvent line has been developed for UV-, IR-, and fluorescent spectroscopy. In addition to high chemical purity, guaranteed high UV- transmittance, and the absence of foreign band absorption in the IR-spectrum, these solvents are UV- and IR-spectroscopy tested. A guaranteed low content of fluorescent substances ensures suitability for fluorescence detection.

Proton-free solvents, such as carbon disulfide, carbon tetrachloride and 1,1,2-trichlorotrifluoroethane are additionally tested for the absence of interfering peaks in ¹H-NMR spectroscopy.

Solvents for hydrocarbon analysis are generally tested at high layer thickness, (figure 2).

Solvents for Residue Analysis

Most organic pollutants in environmental analyses are extracted from matrices like water or soil samples. The composition of the extract is quantitatively analysed after a concentration step. In order to get meaningful results, it is essential that the solvents used for extraction have extremely low levels of the substances to be analysed.

The **PESTANAL**® solvents were developed especially for residue analysis of pesticides and other slightly volatile, environmentally relevant substances by GC/ECD or GC/PND. **PESTANAL**® solvents are tested for suitability in the analysis of polychlorinated biphenyls (PCBs), compounds detected by the GC/ECD test.

There are no contaminants in the retention volume range from pentachlorobenzene to DDT greater than 5×10^{-10} % Lindane, (figure 3).

PESTANAL® specifications are tailor-made to the special requirements of residue analysis of pesticides, metabolites, in-can preservatives and other environmentally relevant substances.

Residue Analysis of highly volatile halogenated hydrocarbons

OEKANAL® solvents are tailored for the trace analysis of highly volatile halogenated hydrocarbons by gas chromatography with ECD detector, and for aromatic hydrocarbons detected by FID.

These solvents are tested in the retention volume range of dichloromethane to pentachloroethane (figure 4) and contain no aromatic compounds greater than 5×10^{-7} %.

Solvents for Residue Analysis of Dioxins, Furans and PCB's

ENVISOLV® solvents are GC-MS tested. This range of products contains less than 5 pg/l (5 ppq) of the 17 relevant dibenzodioxins and dibenzofurans listed below.

Dibenzodioxins

2,3,7,8-tetra-CDD
1,2,3,7,8-penta-CDD
1,2,3,4,7,8-hexa-CDD
1,2,3,6,7,8-hexa-CDD
1,2,3,7,8,9-hexa-CDD
1,2,3,4,6,7,8-hepta-CDD
Octa-CDD

Dibenzofurans

2,3,7,8-tetra-CDF
2,3,4,7,8-penta-CDF
1,2,3,7,8/1,2,3,4,8-penta-CDF
1,2,3,4,7,8/1,2,3,4,7,9-hexa-CDF
1,2,3,6,7,8-hexa-CDF
1,2,3,7,8,9-hexa-CDF
2,3,4,6,7,8-hexa-CDF
1,2,3,4,6,7,8-hepta-CDF
1,2,3,4,7,8,9-hepta-CDF
Octa-CDF

Production and filling of High Purity Solvents

In order to meet the rising demand for the highest purity solvents available, Riedel-de Haën is processing all solvents centrally in a manufacturing plant specially designed for this purpose. Industrial raw materials can be purified to high quality solvents under contamination-free conditions. Distillation units with different capacities enable us to maintain a production level in line with market requirements, (figure 5, figure 6).

All **High Purity Solvents** are filled directly from the receivers of the distillation apparatus. Before filling, each individual packaging is rinsed with the product itself and purged with nitrogen, (figure 7). Absolute filters and clean room conditions ensure a high and stable level of quality, which we document by means of permanent analysis records during production and filling.

We are continually improving the purity of our solvent lines by constantly monitoring the quality of the incoming raw materials, and by regularly upgrading the purification processes.



Figure 5:
First floor of the production plant with distilling retort and several receivers to collect the different fractions.



Figure 6:
Third floor of the production plant giving sight into one of three separated production rooms. Upper part of the distilling column with condenser.

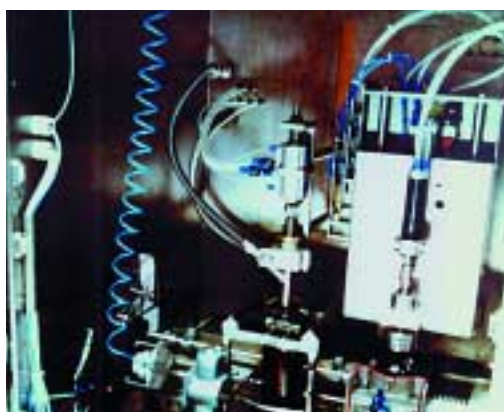


Figure 7:
Laminar flow cabinet with automated filling unit.

From left to right:
bottle rinsing with N₂-drying; filling controlled by an electronic balance; screwing.

Beside the **High Purity Solvents** you can find following product groups:

- **HYDRANAL®** Karl-Fischer Titration
- **PESTANAL®** Standards for Residue Analysis
- **AQUANAL®** Rapid Water Analysis
- **ELISA** Enzyme-Linked-Immuno-Sorbent-Assay
- **FIXANAL®** Indicators, Laboratory Chemicals
- **SODOSIL®** Cleaning Agents

For detailed information about the product groups please contact

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