

QMS 403 C *Aëolos*[®]

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NEW

NEW

Our tried-and-true DIL 402 C has become even more efficient now. Due to its new design, it offers easier handling and increased performance to our customers.

The demand for and importance of thermo-analytical measurements under a water vapor atmosphere are increasing steadily. By combining a water vapor furnace and, for example, an STA 449 C *Jupiter*[®], it is possible to investigate adsorption, desorption and corrosion processes under a defined water vapor atmosphere between room temperature and 1250°C.

The high-pressure DSC 204 HP *Phoenix*[®] now features an expanded temperature range. Upon request, the seasoned DSC 204 HP (max 150 bar, room temperature to 600°C) can now be equipped with a nitrogen cooling device. Depending upon the gas type and pressure, -150°C can be reached. In a helium atmosphere, it is, for example, possible to reach -70°C at 100 bar. The ability to control the cooling process expands the application field of this instrument.

The 32-bit *Proteus*[®] software under MS[®] Windowsä 2000 or MS[®] Windowsä XP Professional, which is fully II,

From Selb to Boston



Dr. Ekkehard Post

Dr. Ekkehard Post, who had been a member of our applications team in Selb for many years, moved to NETZSCH Instruments Inc. (NIB), MA, Burlington, at the beginning of 2003. It is tentatively planned that he will be staying there for two years.

His task will be to share his experience in the fields of thermal analysis and gas analysis, mainly in mass spectrometer and FTIR couplings, with our customers and prospects in North America through consultations, training courses and users' meetings. He will, of course, also be at your service in the laboratory in Burlington (near Boston).

Dr. Post is looking forward to exchanging ideas with you. You can reach him at e.post@nib.netzsch.us.

NEW

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compatible with other measuring systems, has recently also become available for the popular and versatile DMA 242 C. For each temperature/time target amplitudes and frequencies can be applied. It is now possible to recall, evaluate or export saved results during one measurement. Customers who already own a DMA 242 can acquire a software upgrade.

More information on our new developments, can be found on our homepage www.ngb.netzsch.com under *NEWS*.

Stephan Knappe

QMS 403 C *Aëolos*[®] - New Mass Spectrometer for Coupling Systems

Based on our many years of practical experience in the coupling of thermoanalytical instruments to mass spectrometers, a new concept for a capillary coupling to NETZSCH thermobalances (TG) and STA instruments (simultaneous TG-DSC) was created with the introduction of the *Aëolos*[®] quadrupole mass spectrometer - a large step towards a homogeneous functional unit.

Both the hardware and software were optimized for the concurrent operation of the thermal analyzer and mass spectrometer: the system now includes a trigger function for simultaneous start/stop, can record temperature signals, as well as up to 64 pre-selected mass numbers or spectra in the mass range of up to 300 amu (atomic mass unit).

The advantages of a quadrupole system include a compact design, fast scanning through a pre-selected mass range, and analytical selectivity due to the resolution of all detected molecules and fragments in single mass numbers. The new system with high-quality functional components in compact form has a long lifetime and a very service-friendly design. The low-maintenance pump system guarantees an oil-free vacuum and therefore a low background signal which contributes to the high sensitivity.

The volatile sample products during a controlled temperature program in the TG or STA are directly

transferred into the mass spectrometer by means of a quartz glass capillary which can be heated to 300°C. This novel, single-stage coupling system works simply, safely and efficiently; the optimized gas stream conditions circumvent the disadvantages of former capillary couplings and avoid condensation. It is therefore also possible to transfer materials with high boiling temperatures and large molecules. Due to the corresponding mechanical arrangements, the thin quartz glass capillary, which is protected in a heated metal tube, can be easily built in or exchanged and can be positioned exactly in relation to both the ion source and the thermobalance.

The connection at the furnace of the thermobalance is equipped with a heating adapter in order to avoid condensation; a bypass guarantees constant inlet conditions to the mass spectrometer.

New software developments:

The exact time and temperature correlation of thermoanalytical and mass spectrometer data is guaranteed both by the trigger operation and by the recording of the sample temperature. In the NETZSCH Proteus[®] software, the common evaluation of all information and the quantification of mass spectrometer signals are carried out by means of peak area integration. The inputting of parameters for combined TG/STA-MS operation has been simplified through a

fast selection of scan ranges or MID mass numbers.

The new *Aëolos*[®] quadrupole mass spectrometer is an effective and economically priced enrichment to the NETZSCH product range, well-known for its many renowned mass spectrometer couplings, especially the unique Skimmer[®]-System and the couplings to Fourier Transform Infrared Spectrometers.

Two application examples from the polymer field are presented in the following two figures:

Figure 1 depicts a measurement on polystyrene (PS). The

decomposition of polystyrene begins at approx. 350°C (extrapolated onset). Besides various other mass numbers, mainly the styrol monomer (104 amu) and the corresponding dimer (208 amu) are detected.

Shown in Figure 2 are the results for a measurement on a fluorinated ethylene propylene copolymer. During the two-phase decomposition, the tetrafluor-ethylene (100 amu) and hexafluor-propylene (150 amu) monomers were found.

*Erwin Kaisersberger
Dr. Ekkehard Post*

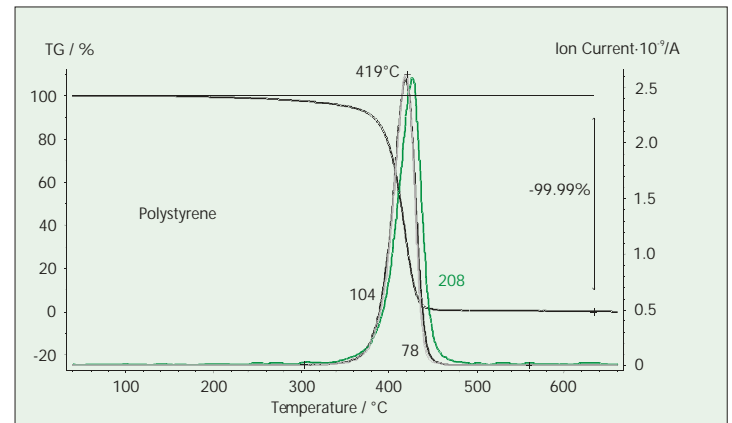


Figure 1. Thermal Decomposition of Polystyrene

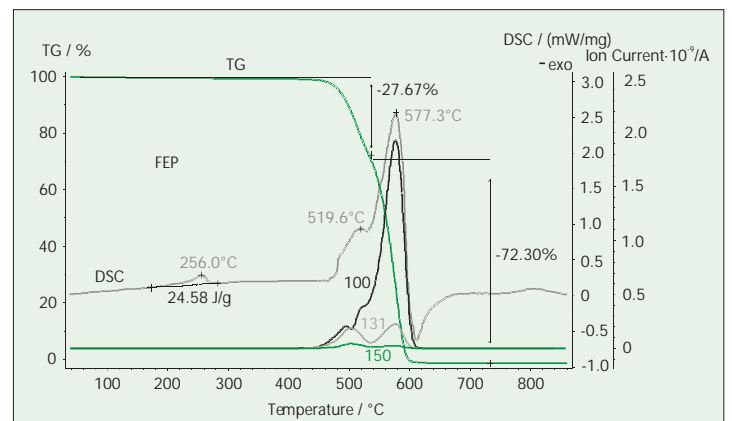


Figure 2. Thermal Behavior FEP up to 860°C

5th SKT 2003 - Advanced Seminar on Coupling Techniques

The combination of thermo-analytical methods and gas analyzing techniques has become increasingly important in the field of materials characterization in the past years. The coupling of thermogravimetry (TG) to mass spectrometry (MS) as well as thermogravimetry to infrared spectroscopy (FTIR) has become an additional source of information for the interpretation of test results.

Along with further development of its instrumentation, NETZSCH-Gerätebau began its scientific work on the application of coupling methods early on. As a result of these efforts, the "Selber Kopplungstage" (Selb Coupling Days) SKT were launched, since 1999 in cooperation with Bruker Optik, Germany. This symposium has since become a renowned event for scientists and researchers in this field.

From May 25th to May 28th, 2003, the 5th Conference on

Coupling Techniques (the 2nd international meeting) will be held at the Steigenberger Hotel in Bad Orb, Germany. The location and timing of the 5th SKT, directly after the ACHEMA and near Frankfurt, were so chosen in order to give prospects from all over the world the opportunity to combine this symposium with a visit to the ACHEMA.

Internationally renowned speakers from universities and industry will lecture on their research activities. The topics will include "Enthalpies of Formation of Sulfate and Nitrate Containing Minerals" (Prof. Dr. Alexandra Navrotsky, University of California, US), "Analysis of Polymer Materials with TG-FTIR Coupling" (Dr. Ralf Kellner, Festo AG & Co., Germany), "Using STA-MS and Pulse-TA for the Study of Metal Oxide Catalysis" (Dr. Ursula Bentrup, Institute for Applied Chemistry, Berlin-Adlershof, Germany) or



Erwin Kaisersberger, NETZSCH-Gerätebau

"Reactivity of Biomass Chars - Oxidation, Hydrocarbons and Inorganics" (Bruce Wymack, Philip Morris Inc., USA). The topics are so diverse that they can not all be mentioned here.

Some of the lecturers are attending this conference for the second time, like, for example, Dr. Michael Feist (Humboldt-University Berlin, Germany), Prof. Denis A. Brosnan (Clemson University, US), and Dr. Marek Maciejewski (ETH Zurich), the "Father of Pulse Thermal Analysis". Renowned attendees such as these attest to the attractiveness of this scientific conference.

Another firmly established item on the SKT's agenda is to give insight into the performance of the individual measuring methods through lectures given by our users, for example, "Potentials and Limitations of the Skimmer MS-System" (Prof. Dr. Armin Reller, University of Augsburg, Germany) and also by NETZSCH and Bruker scientists.

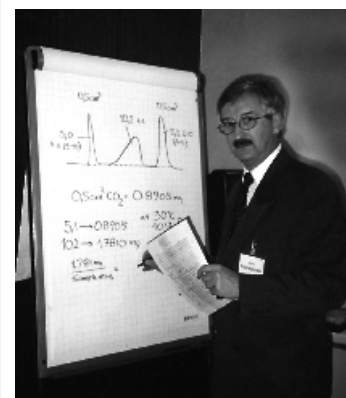
Four functioning TG/STA-MS-FTIR instrument combina-

tions will again be available for practical work (TG 209 C *Iris*[®] with FTIR and PulseTA, STA 409 PC *Luxx*[®] with FTIR, STA 449 C *Jupiter*[®] with *Aeolos*[®] and PulseTA, Skimmer[®]).

All participants will have the opportunity to share their experiences in a small group environment, as well as to acquire new tips and tricks from our experts. You are cordially invited to participate in the 5th SKT.



Prof. Denis A. Brosnan, Clemson University



Dr. Marek Maciejewski, ETH Zürich

We look forward to welcoming you in Bad Orb. Further information, including a registration form, can be found under www.skt2000.com.

Closer to our Customers



Angela Ikonomou Dr. Tatiana Vetrova

Since May 2002, Angela Ikonomou has taken over the support service for the Scandinavian market (Denmark, Finland, Norway and Sweden). Mrs. Ikonomou has a university degree in both chemistry and marketing. Born in Greece, she has been living in

Sweden for more than ten years now.

We have also strengthened our presence in the Russian federation with Dr. Tatiana Vetrova in our office in Moscow. Dr. Vetrova studied physical chemistry at the Mendeleev University in Moscow. She has many years of experience in sales and applications of spectroscopic analytical instruments.

We are happy to count both ladies among our international sales team and wish them much success in their endeavors.

New at NIB



Ron Gulka in front of the NETZSCH Instruments Inc., Burlington office

As of September 2002, Ron Gulka has taken over as Executive Vice-President at NETZSCH Instruments Inc., Burlington, MA, USA.

Mr. Gulka, born in 1955 in Plainfield, New Jersey, studied at Rutgers University, NJ, and graduated with a Master of Science in chemistry.

During the course of his career, he has gathered experience as a Sales Representative, Sales Specialist, Technical Regional

Trade Fairs, Symposia 2003

We will be participating in the following exhibitions:

PITTCON	10 - 13 March, Orlando, FL
Instrurama	2 - 4 April, Brussels, Belgium
Materials Testing	8 - 10 April, London, UK
European Coatings Show	8 - 10 April, Nuremberg, Germany
Pragoregula	8 - 11 April, Prague, Czech Republic
ACerS	27 - 29 April, Nashville, TN
PLAST	6 - 10 May, Milan, Italy
SAMPE	11 - 15 May, Long Beach, CA
ACHEMA 2003	19 - 24 May, Frankfurt, Germany
Int. Symposium Swissbonding	20 - 22 May, Rapperswil, Switzerland
A.F.C.A.T.	20 - 22 May, Mulhouse, France
5 th SKT 2003	25 - 28 May, Bad Orb, Germany
26 REUNIAO ANUAL - SBQ	26 - 29 May, Pocos de Caldas, MG, Brazil
NPE - National Plastics Expo	23 - 27 July, Chicago, IL
Seramitek 2003	29 June - 3 July, Istanbul, Turkey
Int. Kautschuk-Tagung	30 June - 3 July, Nuremberg, Germany
PhandTA 7	7 - 11 September, Innsbruck, Austria
Ceramitec	16 - 20 September, Munich, Germany
NATAS	22 - 24 September, Albuquerque, NM

Sales Manager and North American Sales Manager for high-quality analytical instruments in the field of spectroscopy.

At NIB, he is in charge of organizing and consolidating sales in the US and Canada. He is also responsible for NIB's "Commercial Testing" department and the production of instruments for measuring thermophysical properties.

We wish him much success in his demanding tasks.

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