Institut für Glas- und Rohstofftechnologie

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News:

- Quantitative chemical analyses by use of ICP-OES already from 50 mg
- California 65 proposition – wipe test
- Meltings of new glass formulations, now possible with moulding
- Analysis regarding RoHS conformity
- Sulphur analyses of tin samples of float beds
- Enhancement of microscopy possibilities at IGR with new Zeiss-microscope
- Our glass and raw material services at a glance

Quantitative Chemical Analyses by use of ICP-OES already from 50 mg

The IGR offers a “just-in-time” service, in the case of of food contamination with foreign particles, for years.

Often the customers want to know the supposed origin, especially in case of glass splinters. Besides to the microscopical investigation, the determination of density and semiquantitative analyses by use of SEM-EDX we offer now a quantitative analysis using ICP-OES already from a 50 mg sample mass.

California Proposition 65 – Wipe Test

California Proposition 65 is a Californian law to protect drinking water from toxic substances that may cause cancer and birth defects and to prevent these substances from getting in consumer products. More than 800 hazardous chemicals are listed. Businesses trading in California are obligated to prove the innocuousness of their products or to issue a warning if their products contain hazardous chemicals according to the Californian Proposition 65.

By the wipe test according to NIOSH 9100 – taken also NIOSH 7105 for the detection of lead and cadmium into account – we are able to perform the necessary tests to provide the evidence for the Californian Proposition 65.

For questions concerning the analyses of further listed chemicals, don’t hesitate to contact us.

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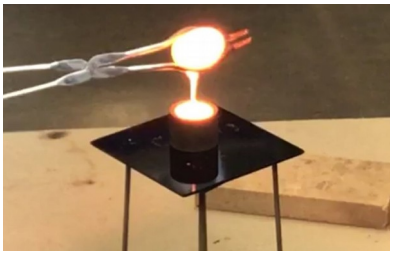
Melting New Glass Compositions - Now Including Forming

In the past, IGR performed test melting at a maximum temperature of 1500 °C. The glass mass was afterwards left in the crucible to cool down and was then ready for the following analyses.
With the new furnace of Carbolite, we are now able to melt bigger batches at a now higher temperature of up to 1600 °C. The still liquid glass can afterwards be casted into moulds.



Analysis regarding RoHS Conformity

The European directive 2011/65/EU (RoHS 2) – abbr. RoHS – regulates the use of hazardous substances in electrical and electronical devices/components.
Next to thresholds for specific organic compounds (PBB and PBDE), expanded in 2015 with several phthalates (DEHP, BBP, DBP & DIBP), the RoHS also sets thresholds regarding the heavy metals lead (Pb: max. 0,1 %), mercury (Hg: max. 0,1 %) and cadmium (Cd: max. 0,01 %) as well as for hexavalent chromium (chromates / Cr^{6+}: max. 0,1 %).
The IGR is accredited for quantitative analyses of trace elements and would be glad to show its qualified support when you got any questions regarding this topic.

Sulphur Analyses of Tin Samples of Float Beds

Modern flat glass is usually made using the float technique, where the still liquid glass is town over a tin bed and its thickness adjusted by top rollers.

For this method the quality of the tin bed is essential. On the one hand, a too high oxygen partial pressure raises the entry of Sn^{2+} in the glass surface, what might lead to the so called bloom effect in a subsequent bending process. On the other hand even very low sulphur entry from the glass to the tin bed leads to a raising vaporisation of the tin – as tin sulphide – which then condenses at the cover of the tin bed and drops as metallic tin on the glass band (drips).

We have developed special analysing methods using SEM-EDX and ICP-OES for the detection of tin entry in the glass surface – alternative to the tin count – as well as for the quantitative analyses of sulphur in the tin.

Enhancement of Microscopy Possibilities at IGR with new Zeiss-Microscope

With the brand new SteREO Discovery V20 microscope of Carl Zeiss, Germany the IGR enhances its analysing spectrum. The modular build stereo microscope delivers high precision and flexibility between overview and detail magnification of up to 225.
The microscope delivers a high depth of focus as it is able to focus on several layers and conclude them to one image, for example as a perfect preparation for following SEM-EDX analyses.

Our Glass and Raw Material Services at a Glance

GLASSPRODUCTION

Chemical Analyses:

- Analysis of the individual elements or element oxides with the ICP-OES according to DIN 51086-2 (after digestion) boron inclusive
- Fe 2+ in glass with phenanthroline in accordance with DIN ISO 14719
- Hexavalent chromium (Cr VI) in glass on the basis of diphenylcarbazide
- Detection of sulfur specifications (SO3 / SO2)
- Hexavalent chromium (Cr VI) in glass on the basis of diphenylcarbazide
- Quantitative and semiquantitative analyses of corrosin, i.a. water resistance of crushed glass at 98 ° C according to DIN ISO 719 and at 121 ° C according to DIN ISO 720, EU Pharmacopeia 8.0 and USP 37 to 41 USP, water resistance of the inner surface of glass by means of autoclave in accordance with ISO 4802-1, EU Pharmacopeia 8.0 and USP 37 to 41 USP, water resistance of the inner surface of glass according to the Russian GOST 13905-2005, resistance to a boiling aqueous solution of hydrochloric acid in accordance with DIN 12116, resistance to a boiling mixture aqueous solution according to DIN ISO 695, migration in acetic acid in accordance with DIN EN 1388-2 investigation pursuant to Directive 2005/31 / EC lead and cadmium permeability and ISO 7086-1 and ISO 7086-2 with the extension to the aluminium, cobalt and arsenic permeability in accordance with Article 3 of Regulation EC 1938/2004

Physical Analyses:

- Density determination,
- Homogeneity assessment in accordance with the ASTM C 978
- Cooling tensions (residual stresses) of hollow glass articles according to groups 1 to 5 with the polariscope in accordance with the ASTM C 148
- Detection of seeds and bubbles
- UV-VIS spectrometry for the valuation of colour characteristics following CIELab and Helmholtz according to DIN ISO 11664-4 and DIN 5033
- FT-IR spectroscopy for the identification of the cold end coating used on surfaces of glass containers, interface measurements on glass surfaces and OH-determination

Thermal Analyses:

- DTA (Differential thermal analysis)
- DSC (Differential scanning calorimetry)
- Determination of the viscosity in accordance to DIN ISO 7884 (log $10^{4,0}$, log $10^{7,65}$ and log $10^{13,0}$)

Glass Properties:

- Surface tension (test of labelability)
- Slip angle
- Distribution of cold end coating (CEC) on the container surface with ABP method
- Impact strength of glass containers according to DIN 52295 (pendulum impact test)
- Thermal shock resistance according to ISO 7459
- Determination of the glass distribution and dimensional tolerance

Glass Defects:

- Inclusions such as stones, crystalline inclusions, nodules, and streaks, investigation and identification by use of microscope, SEM-EDX, ICP-OES, XRF
- Fracture analysis of glass products
- Analysis of bubbles and seeds content by mass spectrometry or Raman spectroscopy

Consumer Complaints:

- Glass artefacts, pieces of glass, minerals, metals, plastics and other contaminants, identification by microscope, SEM-EDX, ICP-OES, XRF

Others:

- Hexavalent chromium (Cr^{VI}) in liquids on the basis of diphenylcarbazide
- Determination of REACH-relevant elements AS, Cd, Cr (VI) Pb, Sb and Se according to REACH regulation n.1907 / 2006 / EC
- Arsenic determination according to EU Pharmacopeia 8.0
- Verification concerning California Proposition 65, wipe test according to NIOSH 9100 and NIOSH 7105
- Dishwasher test

RAW MATERIALS

Chemical Analyses:

- Analysis of the individual elements or element oxides with the ICP-OES according to DIN 51086-2 (after digestion)

Physical Analyses:

- Sieve analyses (DIN 66165)
- Bulk density of raw materials (International Standard ISO 697 (earlier edition: DIN 53912))
- Loss of ignition at different temperatures (e.g. 550 °C, 1100°C) following DIN 51081
- Humidity of raw materials and batches following DIN ISO 11465
- Heavy mineral content in the raw material
- Separation of iron (rich / containing) particles with a neobdymium-magnetic-separator
- Determination of HCL-non-soluble components, e.g. silicate in limestone
- Decrepitation test

GLASS RECYCLING

Chemical Analyses:

- Analysis of the individual elements or element oxides with the ICP-OES according to DIN 51086-2 (after digestion)
- Determination of total carbon content, content of chloride and loss of ignition (DIN 51081)

Physical Analyses:

- Lot sorting for the determination of impurities
- sieve analyses and determination of impurities particularly KSP
- investigation of hollow glass cullets for the semiquantitative determination of glass ceramic or lead containing cullets
- detection of corundum or other infusible particles e.g. like zirconia and metals