



Analytical Techniques for Glass

Glass analysis comprises a vast number of analytical techniques. Each step in the glass processing and production process requires its own set of characterization techniques.

Typical Applications	Analysis Techniques
Composition	
Glass, (raw) materials	XRF, ICP-OES, ICP-MS
Trace elements	(LA-)ICP-MS, NTM
Homogeneity (glass, batch, mixer efficiency)	XRF
Free water content	LOD: Loss on Ignition
Carbonates, organic compounds, crystal water	LOI: Loss on Ignition
Surface analysis	XPS/ESCA, (TOF-)SIMS, Auger
Iron content & valency: Fe(II)/Fe(III)	XRF, UV/VIS/NIR, Titrimetry
Water (β -OH) in quartz	IR
Cullet (recycle glass)	XRF
Physical Properties	
Optical properties	Transmission, Reflection (UV/VIS/NIR/IR)*
Refractive properties	Abbe Refractometry, Ellipsometry
Thermal properties	Dilatometry, Electrical resistance
Glass forming/shaping	Fiber Enlongation Viscometry, Beam Bending Viscometry, Rotation Viscometry
Glass defects	XRF/SEM/XRD/LA-ICP-MS/RGA
Particle size	Air Jet Sieve (45-5600 μ m), Laser Diffraction (0.02-2000 μ m)
Glass joining	Stress
Various	
Analysis of dust in exhaust filters	XRF
Melting tank refractories	XRF, XRD
Identification of glass fragments in e.g. food	XRF, SEM/EDS

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