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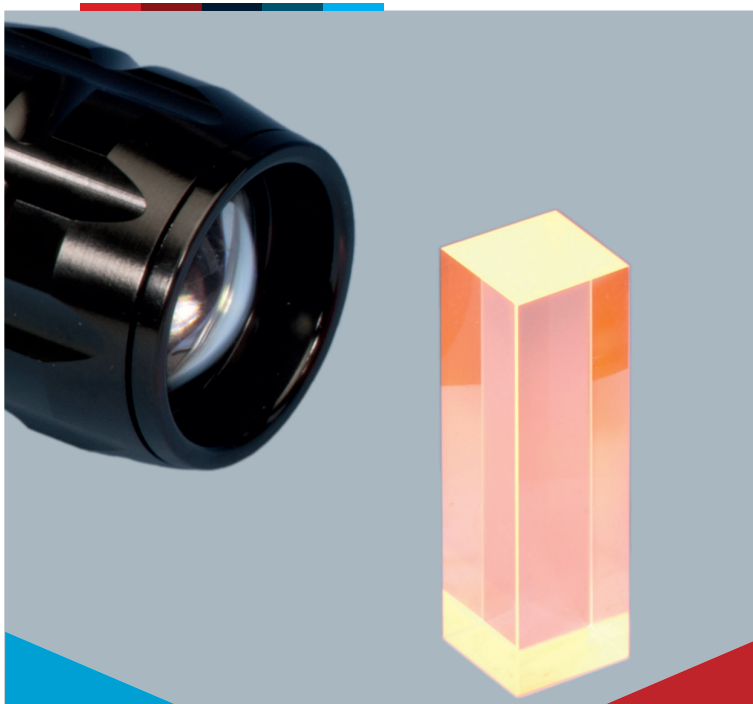
Sicherheit in Technik und Chemie



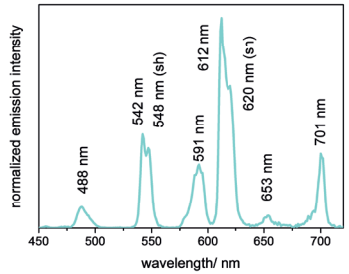
CERTIFIED REFERENCE MATERIAL BAM-F012

Glass-based Multi-emitter Fluorescence Standard

CRM BAM-F012

Glass-based Multi-emitter Fluorescence Standard

- The reference material consists of a rectangular block of a fluorescent multi-emitter (ME) glass with typical cuvette dimensions (12.5 mm x 12.5 mm x 40 mm) and four polished long faces. This CRM was prepared from a lanthanum phosphate glass melt doped with the luminescent rare earth (RE) metal ions Cerium(III), Terbium(III), and Europium(III). [1, 2]
- The fluorescence spectrum of the ME glass shows several relatively sharp emission bands in the wavelength region between 450 nm and 720 nm.
- The normalized emission intensities, used for certification of the emission intensity pattern were derived from an emission spectrum corrected for the instrument-specific spectral responsivity s (λ) of the BAM reference fluorometer equipped with a continuous excitation light source (excitation at λ_{exc} exc = 365 nm). [3-5]

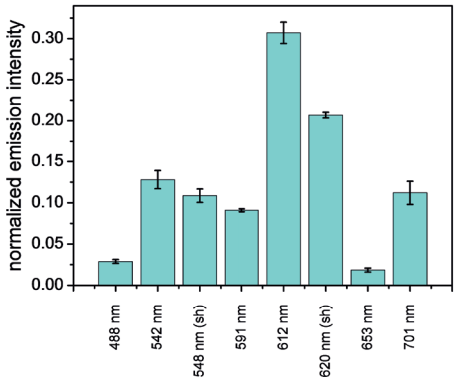


Normalized, spectrally corrected emission spectrum of BAM-F012 with eight bands and shoulders (sh); excitation was at 365 nm.

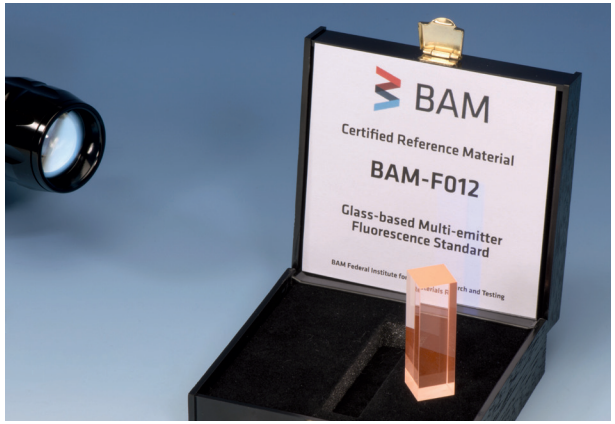
- A Standard Operation Procedure (SOP) for use of fluorescence standard BAM-F012 is included.
- The reference material is ready-to-use.

CERTIFIED PROPERTIES

Normalized intensities of eight emission peaks ("emission intensity pattern") of the multi-emitter (ME) glass BAM-F012. The intensities of the emission peaks were normalized by the sum of the signal maxima.



Emission intensity pattern of BAM-F012 with uncertainties using a coverage factor of k = 2 corresponding to a confidence interval of approximately 95 %, as defined in the GUM (ISO/IEC Guide 98-3:2008). [6]



AREA OF APPLICATION

- BAM-F012 is intended as standard for Instrument Performance Validation (IPV) of fluorescence instruments with continuous excitation sources by regular evaluation of variations of the emission intensity pattern measured under identical measurement conditions.
- The reference material can be employed as wavelength standard for the validation of the wavelength accuracy of the emission channel, especially for fluorescence instruments with low requirements on spectral resolution.
- BAM-F012 is suited to monitor temporal changes of the wavelength-dependent spectral responsivity of fluorescence instruments [3-5] by comparison of the emission intensity pattern of the uncorrected spectra using identical instrument settings. This requires strict control of the excitation wavelength accuracy.
- BAM-F012 can be used to compare the performance of fluorescence instruments and for the determination of instrument-to-instrument variations, yet this needs use of identical measurement conditions and instrument settings and should only be done for instruments with continuous light sources.

Metrological Traceability

The certified relative emission intensity pattern of BAM-F012 is based on spectrally corrected emission spectra, measured with the calibrated BAM reference spectrofluorometer SLM 8100, which ensures metrological traceability to the SI unit of the spectral radiance. [3, 7]