Developing a new photometric standard for light emitting diode (LED)

-Ensuring reliable photometric evaluation of LED-

We are developing a new standard for total spectral radiant flux calibration. The standard is useful for photometric evaluation of light emitting diode (LED) and solid-state lighting (SSL).

LED and SSL show large potential to promote new industries in the future and to reduce the energy consumption of future lighting. However, photometric evaluation of LED or SSL is difficult and it is feared that unreliable evaluations of LED or SSL emerging in the market threaten consumer confidence leading to a delay in market acceptance of LED or SSL.

The difficulty arises from the unique spectral distributions of LED and SSL. The spectral distributions of LED and SSL are quite different from those of the traditional light sources, and the variety of the spectral distributions is much wider than that of the traditional light sources.

The total luminous flux standard, which is widely used for photometric evaluation of the traditional light sources, is not appropriate to LED or SSL evaluation. The total spectral radiant flux standard is necessary for reliable photometric evaluation of LED and SSL.

Tatsuya ZAMA

Metrology Institute of Japan

zama-t@aist.go.jp

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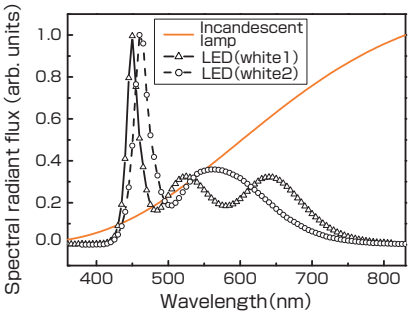

Spectral distributions of incandescent lamp and white LEDs
There are many white LEDs whose spectral distributions are different from those shown in the figure.

Nanopore standard: Supporting R&D of innovative materials

Highly-reliable measurement of positron lifetimes and the world's first nanopore reference materials

We developed the first nanopore reference materials in the world using synthetic fused silica and polycarbonate for positron hole-size measurements, which are intended for use in controlling the precision as well as in validating the condition of conventional bulk positron lifetime measurements. The first one (fused silica), having a certified value of 1.63 ns for the third lifetime component, had been released in July 2007 as the certified reference material (CRM) of AIST, followed by the second CRM (polycarbonate) with a certified value of 2.10 ns, released in May 2009. The established CRMs are promising in supporting R&Ds of innovative functional materials with engineered nanoporosity, such as inter-layer dielectrics for next generation semiconductors and high-performance separation membranes.

Kenji ITO

Metrology Institute of Japan

k-ito@aist.go.jp

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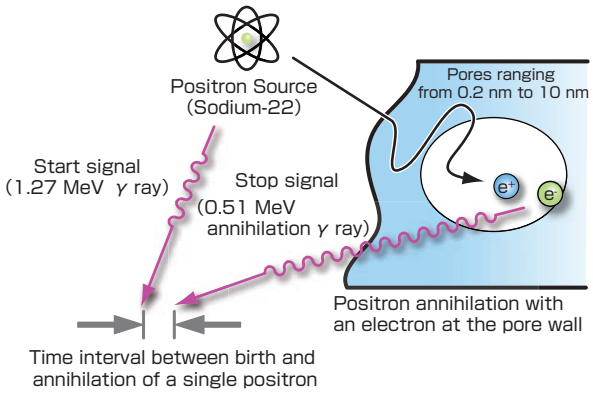

Principle of the positron annihilation lifetime measurement.