SMART

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NANOTECHNOLOGY IN PHOSPHOR MATERIAL:A NEW PERSPECTIVE

Persistent luminescence is an ancient old riddle that has puzzled mankind for over 400 years since the discovery of Bologna stone in Europe. Ancient Chinese and Japanese too have their ancient records on phosphorescence phenomena that date back over thousand years.

At the end of 19th century, with the accidental discovery of Sidot blende, mankind has entered the scientific and modern age on investigations and study of inorganic luminescence materials or phosphor material. After many decades of research work, it was then we discovered that by co-doping ZnS: Cu, Co, the afterglow duration can be prolonged. However the exact mechanism to explain these phenomena remains unsolved and unclear. Despite this, mankind has continued to apply the persistent luminescence phosphor on many applications such as luminous paints, watches, clocks, radar display, emergency lighting, and detection of high energy rays, optical memory and image storage. In mid 1990s, a new type of long afterglow phosphor was discovered and announced from the publication of Matsuzawa's paper on $SrAl_2O_4:Eu^{2+},Dy^{3+}$ long afterglow phosphor, this phosphor soon displaced ZnS:Cu,Co as a far much better afterglow phosphor from longer hours duration and brightness perspectives. Since then many new long afterglow phosphor has been uncovered, in which the Eu^{2+} dopant is used as the main luminescence centers. However again, numerous attempts to unravel the mysteries of these long afterglow phenomena remain not completely revealed thoroughly.

In this talk, the remaining last half jigsaw puzzle behind persistent luminescence phenomena or phosphorescence of inorganic materials has been laid out as we ponder over the true meaning of the words, "nanotechnology in phosphor material". The relationship of the word "nanotechnology" or "nanoparticles" or more specific, "organic coated nanoparticles" to the explanations of the observation of phosphorescence phenomena on Emperor Tai Zong's painting (Song Dynasty), a distant time span of over 800 years.

Location: "illuminate room"
level 12, CREATE tower

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Time: 4 PM

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