

Method of stabilizing charged states of lanthanides in luminophore production process

About technology

Maintaining proper stabilization and controlling concentration of lanthanides at a given oxidation state $[(n+1)^+ \text{ or } n^+]$ is one of the key factors in the design and manufacturing processes of luminophores with defined luminescence properties. Depending on their oxidation states, spectral properties of lanthanides may differ significantly, allowing for the production of phosphors of different colours.

Developed method of stabilisation of charged states of lanthanides has many advantages over current techniques utilised in production of light-emitting materials. During a typical process of synthesis of materials enriched with lanthanide ions, the only parameter affecting the lanthanide concentration at a given oxidation state is the time given material is being heated in a suitable reducing or oxidizing environment. Control of concentration of oxidised lanthanides based on co-enrichment is a much more efficient method, due to its incomparably higher precision. Furthermore, elimination of one of the steps (re-heating of the material under appropriate conditions) in the synthesis process translates into a lower cost of phosphor production, should proposed method be utilised. The method is reproducible, requires no specialized apparatus and can be used even in a modestly equipped laboratory.

Invented method may be applied during the production of lighting materials such as light bulbs, screens, displays or vertical and horizontal high-visibility markings on roads and motorways.



Research Team

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IP Protection:

- Polish patent granted nr 231232

Implementation progress

TRL 4 –Technology validated in laboratory conditions.

Cooperation opportunities

- Sale of property rights
- Licence
- Partnership for further research and commercialisation