

ABSTRACT - ORAL

From powders to crystals: challenges in transparent persistent phosphors

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The presentation focuses on strontium aluminate-based glow-in-the-dark materials, like $\text{SrAl}_2\text{O}_4:\text{Eu,Dy}$, and their development from powders to optically transparent formats such as single crystals and transparent ceramics. While increasing optical volume should enhance emission, large crystals exhibit optical effects—primarily optically stimulated detrapping—that rather unexpectedly diminish light output. A second focus is on the critical role of lanthanide dopants like europium and dysprosium, which are responsible for both light emission and energy storage. In transparent ceramics and crystals, these dopants tend to aggregate at grain boundaries, negatively affecting performance. A range of analytical techniques is used to investigate and quantify this dopant behavior.