Critical raw materials in lighting applications: Substitution opportunities and implication on their demand

Abstract:
Trends towards more energy efficient lighting and high performance display technologies have recently increased the demand for certain materials, which are considered ‘critical’ in terms of potential supply constraints. In this article, we assessed the substitution possibilities of these critical materials and analysed the impact of technological trends on their short term demand. Substitution of fluorescent with more advanced light-emitting diode (LED) technology significantly decrease the demand for europium and yttrium, though, demand for gallium and indium will increase. Germanium and terbium will no longer be significantly used by the lighting sector by 2020. The next-generation of lighting technology – organic-LED (OLED) – is expected to eliminate the need for critical materials with the exception of indium. However, a wide adoption of OLED technology in general lighting is not expected before 2025.

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