# The luminescence properties of three tetrakis dibenzoylmethane europium(III) complexes with different counter ions.

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We report the synthesis and emission properties of some europium compounds, which are highly luminescent under UV excitation, formed by the tetrakis complex anion of $[Eu(dbm)_4]^-$ type with three different counter cations: $N(C_2H_5)_4^+$, $P(C_6H_5)_4^+$ and $As(C_6H_5)_4^+$. For $(N(C_2H_5)_4)[Eu(dbm)_4]$, only one $Eu^{3+}$ site, site (a), was observed with an emission lifetime of 0.301 ms and an evaluated quantum efficiency of 27.0% at 77 K. The presence of the $P(C_6H_5)_4^+$ or $As(C_6H_5)_4^+$ cations in the salts causes a decrease of the lifetime and the quantum efficiency of the $Eu^{3+}$ ions occupying the site (a). Moreover, steric effects resulting from the incorporation of the larger counter ions into a crystal structure lead to a formation of another site, in which $Eu^{3+}$ ions have significantly longer lifetimes and higher quantum efficiencies compared to the site (a), equal to 0.829 ms and 41% for $(P(C_6H_5)_4)[Eu(dbm)_4]$, and 0.815 ms and 35% for $(As(C_6H_5)_4)[Eu(dbm)_4]$, respectively.

Słowa kluczowe

Europium(III) complex, Luminescence properties, Tetrakis complex

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