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Adrian Olvera Nolasco

National Autonomous University of Mexico
Mexico

Optic and structural study of new Co^{2+} - Ln^{3+} hybrid coordination compounds with luminescent properties and their possible application in LED technology.

Abstract:

Currently, lanthanide ion coordination compounds are used in lighting technology, screens, money safety marks, and light phosphor converters. They present photoluminescent properties, with fine emission bands unaffected by their chemical environment. [1-3] Lanthanide ion's emissions can be improved by coordinating them to a chromophore that absorbs energy and transfers it to the ion, thus enhancing luminescence. This ligand acts as a sensitizer (antenna effect).[4] Previous reports indicate that Salphen derivatives and their d-block metal coordination compounds may enhance lanthanides' emissions. However, only Schiff-base coordination compounds with closed-shell d-block metals such as Zn^{2+} and Cd^{2+} have been used. [5-10] Coordination compounds containing ion metals like Cr^{3+} and Co^{2+} are dark materials due to charge transfer bands absorptions that may quench luminescence. We observed that salphen d-f (Co^{2+} - Ln^{3+}) hybrid coordination compounds display luminescence in solution or a solid dispersion. The thermal stability of the compounds above 200 °C and their photoluminescent properties could make them suitable for light phosphor conversion on LED technology.

Biography

Adrian Olvera Nolasco obtained his B. Sc. (Chemistry) in 2018 and completed the M. Sc. (Chemistry) in 2021. He is pursuing a PhD in Chemistry at the Universidad Nacional Autónoma de México.