

Poster Presentation

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Temperature / pressure-dependent luminescence spectra of square-planar complexes

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Luminescence properties of square-planar complexes of platinum(II) and palladium(II) with a d8 electron configuration were investigated. Blue shift of the maxima of the luminescence spectra occur for pressure-dependent spectra of several complexes of both metals. This is due to a structural compression of the crystalline lattice, which causes a destabilization of the LUMO orbital for these complexes. Other structural changes can also occur, providing a more important slope of the blue shift. Also, intermolecular interactions cause a red shift in pressure-dependent spectra. In temperature-dependent spectra, opposite trends occur for several analog complexes. Palladium(II) complexes show a red shift of luminescence maxima with increasing temperature. Platinum(II) compounds exhibit a blue shift. This difference is explained with theoretical calculations of luminescence spectra. In these trends, the dominant effect is due to an increase of vibronic contributions with temperature. We also present a complex of platinum(II) in which the structural effect is dominant in the spectra with increasing temperature, leading to a red shift. This rare effect allows the study of structural changes with temperature for square-planar platinum(II) complex.

Keywords: Pressure-dependent luminescence spectroscopy, Temperature-dependent luminescence spectroscopy, Platinum(II) complexes