Structural and photophysical properties of [(CO)<inf>3</inf>(phen)Re(?-Br)Re(phen)(CO)<inf>3</inf>]⁺[(CO)<inf>3</inf>Re(?-Br)<inf>3</inf>Re(CO)<inf>3</inf>]⁻: Where does its luminescence come from?

Gallardo, Hector

Cepeda-Plaza, Marjorie

Nonell, Santi

Günther, Germán

Chamorro, Eduardo

Pizarro, Nancy

Vega, Andrés

The multimetallic complex [[(CO)<inf>3</inf>(phen)Re(?-Br)Re(phen)(CO)<inf>3</inf>][(CO)<inf>3</inf>Re(?-Br)<inf>3</inf>Re(CO)<inf>3</inf>]]·CH<inf>2</inf>Cl<inf>2</inf> was prepared by direct reaction of (Re(CO)<inf>3</inf>(THF)Br)<inf>2</inf> (THF: tetrahydrofuran) and 1,10-phenanthroline in a 1:1 ratio, followed by recrystallization in dichloromethane. The compound is an ionic salt where both, cation and anion, are bimetallic complexes. Inside both of them the Re^I centers are bridged by one or three bromides respectively. The compound has an absorption band centered at 375 nm in CH<inf>2</inf>Cl<inf>2</inf>, which has been assigned to a MLCT band. Excitation at 375 nm produces luminescent emission at 608 nm. Comparison of these results with closely related rhenium complexes, in addition to Time Dependant-DFT analysis, allow us to propose the [(CO)<inf>3</inf>(phen)Re(?-Br)Re(phen)(CO)<inf>3</inf>]⁺ cation as main respons