

Abstract

Applications and Properties of Lanthanide Complexes Sensors

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In the last time, experts estimate that industrial processes introduce up to a million different pollutants into the atmosphere and the aquatic ecosystem, and heavy metals are one group of these substances.

In this presentation the absorption (transient absorption) and emission (steady state and time-resolved fluorescence) spectroscopy were used to study, investigate and characterize the mechanisms of fluorescence quenching and obtaining new sensors for to detect toxic environments: heavy metals from water. For these purpose new compounds, lanthanide complexes were obtained by condensation between the siloxane diamine and dialdehyde, and were synthesized for to have a high quantum yield, stability and selective sensibility. The fluorescence quenching of these metal complexes by different metal ions such: Ni²⁺, Cu²⁺, Co²⁺, Zn²⁺, Fe³⁺, Mn²⁺, Ca²⁺, Pb²⁺, Cd²⁺, Sr²⁺, Mg²⁺, were been study in solution/film at different variation in time, for to demonstrate that these samples have a good stability and can be used as fluorescence sensors for the selective detection of metal ions.

For fundamental study, theory of dynamic quenching, theory of static quenching and combined dynamic and static quenching were used, and constants of the process, the lifetime in excited state, the quantum yield were estimated and depend on the substitution of metal ions.

A new application of the compounds investigated for detection of toxic environments was obtain, sensor for to detect Fe from water.

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