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#### DEVELOPMENT OF IONIC SOFT MATERIALS TO PHOTOLUMINESCENCE

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Soft materials include a wide range of components such as gels, colloids, and thin films. These materials presents optoelectronic properties associated with the easy processing, recyclability, efficiency<sup>1</sup>, and can be employment in design of advanced devices, especially with technological applications. In this context, recognizing the potential of photovoltaic cells, several research groups dedicated to the optimization energy production these devices, such as dye-sensitized solar cells. As sensitizing agents are used conducting polymers, among others. A recent option is the luminescent solar concentrators (LSCs) consisting of films have optically active centers which collect incoming solar light and re-emit at specific wavelengths. However, the systems used, showed decreasing the losses from self-absorption. The characteristics relating to photoluminescence of lanthanide ions<sup>4</sup>, make them excellent for composition of news LSCs. The emission of the lanthanides can be enhanced by metal sensitization by organics systems that act as chromophores, such as ionic liquids. Ionic liquids (ILs) are organic salts with melting point below 100°C, may be associated with metal compounds, preparing materials with photophysical/optical properties. Due the electrochemical characteristics, together with the outreach capacity of the luminescence of lanthanide is justified the use of ionogels as LSCs. However, the materials obtained have poor mechanical properties and photodegradation before exposure to ultraviolet radiation. The objective of this work is develop ionic liquids, with high yield, purity and terminals for complexation (sultones or carboxylates) with metals. We intend to employ these ionic liquids in the synthesis of coordination compounds with lanthanide ions elaborating thus luminescent ionogels as already reported in the literature. For a complete characterization of the materials we used nuclear magnetic resonance (NMR), infrared spectroscopy (FTIR), Thermogravimetric Analysis (TGA), and Photoluminescence. Results and Discussion The FT-IR spectrum of the IL (with terminals sultones or carboxylates) and luminescent materials, is characterized by the absorption bands around 3090 cm<sup>-1</sup> and is consistent for C-H bonds in imidazole ring. The stretch in 1460 cm<sup>-1</sup> for CH<sub>2</sub>, 1650 cm<sup>-1</sup> is attributed to C=C and/or C=N<sup>10</sup>. Bands in the range of 1575 cm<sup>-1</sup> can be attributed to ring stretching of the imidazolium of the IL. We observed, in ILs sultones, the stretching symmetrical 1035 cm<sup>-1</sup> and 1180/1300 cm<sup>-1</sup> asymmetric, which can be applied to stretch S=O as noted earlier. The region between 750-1000 cm<sup>-1</sup> is consistent to S-O stretch. All of these stretches are kept in luminescent materials developed from the ILs sultones, and identified as compatible shift to stretching S=O. This suggests the lanthanide coordination with oxygen belonging to sulfone terminal. In both ILs (sultones or carboxylates) we still observed the broadband at 3500 cm<sup>-1</sup> which corresponds to O-H water, and indicates an increase in the hydrophilic character of luminescent materials in relation to IL. The result identified at approximately 3200 cm<sup>-1</sup> N-H indicates the intermolecular hydrogen bond in the gel phase, as previously reported. Para os ILs com terminais carboxilatos são identificados estiramentos na faixa 1500 cm<sup>-1</sup> associate to C=O. The photoluminescence of ILs were investigated from your excitation and emission spectra. The excitation spectra of IL show the presence of a band centered at 369 nm to ILs sultones, and at 320 nm to carboxylates, which is associated with the transition pi-pi\* of the IL ligand. Both species of ILs are transparent in the emission of the lanthanide region. This fact enables the construction of several systems of coordination with lanthanides, whose goal is to raise awareness metal photoemission. Conclusions We established an efficient method for obtaining luminescent gels at room temperature without solvent or stirring. The synthesized luminescent ionogels showed excellent photophysical properties. All characterization (FTIR, RMN, TGA, and photoluminescence) to ILs, and ionogels, is under investigation.