IONIC LIQUIDS FOR SAMPLE PREPARATION

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Room temperature ionic liquids (ILs) are compounds formed of organic cations and inorganic or organic anions that are characterised to present a broad range of different physicochemical properties. For instance, some are highly viscous, and others flow like water, some are acidic, and others are basic; some are hydrophilic, and others insoluble in water. In general, room temperature ILs have many properties of conventional organic solvents, such as excellent solvation qualities. ILs are non-volatile with a negligible vapour pressure that allows them to be operated at elevated temperatures without facing solvent loss due to evaporation. In addition, they have a good thermal stability, and can remain liquid over a range of 200 to 300º. All of these properties make IL a suitable solvent to carry out sample treatment.

In this communication the main applications of ILs in sample preparation will be discussed, making especial attention to the problems and challenges. In this way, examples will be focussed to extraction of environmental contaminants as well as the extraction of nanomaterials in both environmental and biological samples. ILs have been demonstrated to be an exceptional solvent to preconcentrate organic and inorganic nanomaterials.

The use of ionic liquids in combination with carbon nanomaterials above 0.5-1% , mainly carbon nanotubes, allows a soft material. These materials present a high capacity to adsorb but also to absorb analytes. The most important aspect is the synergic effect that exists between the carbon nanotubes and the ionic liquid which result in a high capacity to preconcentrate analytes. The application of these news materials to extract contaminants from environmental samples will be also presented and discussed in this communication.