NEW IONIC LIQUIDS AND SALTS DERIVED FROM β-LACTAM ANTIBIOTICS

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In recent years ionic liquids (ILs) have been increasing the popularity and the number of applications. Ionic liquids were used mainly as solvent in organic synthesis, but in recent years they are also used in analytical chemistry, separation chemistry and material science. Additional to significant developments in their chemical properties and applications, ionic liquids are now bringing unexpected opportunities at the interface of chemistry with the life sciences.

Ionic liquids (ILs) are currently defined as salts that are composed solely of cations and anions which melt below 100ºC. Our goal in this work is to explore the dual activity of the ionic liquids, due to the presence of two different ions, an anion with bacterial activity as β-lactam antibiotics and different kinds of cations.

In this work the anions of ILs and salts were derived from three different antibiotics: ampicillin, penicillin and amoxicillin. The cations were derived from substituted ammonium, phosphonium pyridinium and methylimidazolium salts, such as: tetraethyl ammonium, trihexiltetradecilphosphonium, cetylpyridinium, choline (an essential nutrient), 1-ethyl-3-methylimidazolium, and 1-ethanol-3-methyl imidazolium structures.

Commercial ammonium and phosponium halogen salts were first transformed into hydroxides on ionic exchange column (Amberlite IRA-400) in methanol. The prepared hydroxides were then neutralized with β-lactam antibiotics. After crystallization we obtained pure ILs and salts containing β-lactam antibiotics.

This work presents a novel method for preparation of new salts of antibiotics with low melting point and their chemistry and microbiological characterization.

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