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Preparation of modified thionucleobases and thionucleosides using room temperature ionic liquids as solvents

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Nucleoside chemistry is an important research area in drug development. Various kinds of chemical modified nucleobases, nucleosides, nucleotides and oligonucleotides have shown biological activities. One of the challenges associated with the nucleoside chemistry is the poor solubility of these compounds in the commonly used organic solvents. The conventional polar solvents such as DMF, DMSO and N-methylpyrrolidone (NMP) have been employed, but they are hazardous to the environment. Thus, there is a need to develop alternative solvents and technologies for nucleoside chemistry due to the increasing need for protecting the environment. Good solubility of these chemicals in ionic liquids provides an opportunity to solve this problem. Considering the advantages of using ionic liquids for nucleoside chemistry, as a part of our continuous efforts in utilization of ionic liquids for various synthetic reactions, we have synthesized modified thionucleobases and thionucleosides using various RTILs with the aim of developing anti-viral and anti-cancer agents. Ionic liquids 1-methoxyethyl-3-methylimidazolium methanesulfonate {[MeOEtMIM]⁺[CH₃SO₃]⁻} and 1-methoxyethyl-3-methylimidazolium trifluoroacetate {[MeOEtMIM]⁺[CF₃COO]⁻} have been used as solvents and catalysts for the preparation of modified thionucleobases and thionucleosides. These reactions proceeded effectively and efficiently in various ionic liquids.

Biography

Qinguo Zheng is the Professor in School of Life & Health Sciences at Aston University, UK. His research interests are development of novel methodologies for synthesis of modified nucleic acids and peptide nucleic acids, and their use as potential antisense therapeutic agents. He has completed post doctorate from MRC Toxicology Unit, University of Leicester, UK.

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