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Removal of anti-cancer drugs from human urine using supported ionic liquids: an alternative approach to avoid their entrance into the environment

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PURPOSE OF THE ABSTRACT

In an era where the aging of population is continuously increasing, the number of worldwide cancer cases follows the same trend [1]. Aiming at improving life quality, pharmaceutical advances are moving toward more effective anticancer therapies, where the use of cytostatics such as cyclophosphamide plays a significant role [2]. As with other pharmaceuticals, one of the major sources of contamination of the environment by cytostatics occurs through the patients urine excretion. However, current wastewater treatment plants' are inefficient at removing/treating cytostatics [3]. In order to prevent aquatic ecosystems contamination, the development of a new route to eliminate such drugs directly from urine is here suggested, namely by the use of supported ionic liquids (SILs) that can be used to create a device to deliver to oncologic patients. In this work, the synthesis and characterization of several SILs using silica as the support material was carried out, and their adsorption potential for cyclophosphamide (a model cytostatic here studied) was investigated. By playing with the IL cation structure, it is possible to significantly improve the removal of cyclophosphamide from urine samples.

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FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

PHARMACEUTICALS | ENVIRONMENTAL IMPACT | REMOVAL | SUPPORTED IONIC LIQUIDS

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