BIODEGRADATION STUDIES OF A SERIES OF DIPEPTIDE BASED IONIC LIQUIDS AND THEIR TRANFORMATION PRODUCTS

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Ionic liquids (ILs) with their potential for high recyclability, low volatility, low flammability and potential for synthesis from renewal materials are often seen as „greener“ alternatives to organic solvents. However, early generations of ILs were designed to be robust and inert to a range of chemical conditions and thereby have been shown to be poorly biodegradable.[1-2] As ILs are increasingly being used in large-scale industrial processes [3], the need to assess their biodegradability is important to avoid possible release of yet another source of persistant organic pollutants to the environment. Our group recently published a mineralizable pyridinium IL (Fig. 1) alleviating the problem of persistent breakdown products.[4]

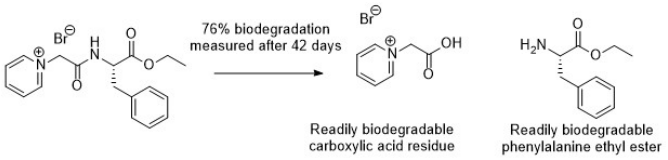

Fig. 1 Fully mineralizable IL, for which an amide bond cleavage is assumed resulting in ultimate biodegradable phenylalanine ethyl ester and carboxylic acid residue.

Several standard tests are in place for evaluation of biodegradability with closed bottle test (OECD 301D) being one of them. Modification of this test [5] allows for a high-throughput screening of compounds for their biodegradability. In this presentation results obtained using modified closed bottle test on a series of dipeptide based ionic liquids and their proposed transformation products are presented.

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