Green by Enhanced Performance: Multiphase Ionic Liquid Catalysis and Ionic Liquid Based Separation Technologies

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Ionic liquids are not intrinsically green! They are a class of fascinating, new liquid materials with unique combinations of properties. By making use of those unique properties, more efficient and greener processes and devices can be realised. As a consequence of this statement the "greenliness" of an ionic liquid has to be always defined by its performance in a specific application. Performance of an ionic liquid in a given application is a strong function of the structure of the ions forming the liquid. The contribution will first introduce different concepts of multiphasic catalysis using ionic liquids. For each concept – liquid-liquid biphasic catalysis, heterogeneous catalysis in ionic liquids and Supported Ionic Liquid Phase catalysis – the "green factors" provided by the ionic liquid concept and the most important aspects of proper ionic liquid selection will be discussed. Green separation technologies based on ionic liquids will be discussed for the example of deep desulfurization of hydrocarbon mixtures using liquid-liquid extraction and SILP absorber techniques.