Direct and Indirect Electrochemical Synthesis of Organic Compounds in Ionic Liquids

Recently, electro-organic synthesis has emerged as an environmentally friendly synthetic route for the oxidation and reduction of organic compounds because dangerous and toxic redox reagents often used in classic reactions are not required. Our goal is to activate the C-H bond by tuning the electrode surface and electrolyte properties (e.g. organic solvents, ionic liquids). The model reaction system will be the electro-reductive coupling of aryl halides and pyrroles with and without the use of redox-active mediators like perylene-3,4:9,10-tetracarboxylic acid diimide derivatives (PDI). The electro-organic reaction will be investigated by using a broad combination of spectroscopic and electrochemical tools like NMR, FT-IR, MS, GC, CV and LSV.