



Third Laureate Fundamental Research



- ◆ **Project Title:** Electrochemical Synthesis of New Organic Compounds under Green Conditions
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Abstract:

Electrochemistry is an ideal tool for reversing the polarity of organic molecules which is providing possibility of reactions in order to coupling of two electrophiles, two nucleophiles or one nucleophile with electrophile in ways that would be otherwise impossible. Here, we would like to report the use of electrochemical method as a powerful tool in synthesis of some new organic compounds based on oxidation of catechols in the presence of various types of nucleophile and has been shown that these compounds can be oxidized to o-benzoquinones. The electrochemically generated o-benzoquinones are quite reactive and can be attacked by a variety of nucleophiles undergo various mechanisms such as EC, ECE, ECEC, ECECE, ECECECE, etc. The mechanisms and final product are depending on some parameters such as, nature of nucleophile (electron withdrawing or donating), electrolysis medium (solvent, acidity or pH) and catechol type. Also, from the point of view of green chemistry, use of the electrosynthesis method has some important advantages. Clean synthesis, use of electricity as energy instead of oxidative reagents, use of aqueous media instead of organic solvents, one-step reaction, work at room temperature and pressure, technical feasibility, and especially dramatically high atom economy are of preeminent green advantages.