

A NEW ELECTROREDUCTIVE ANNELATION REACTION IN HETEROCYCLIC COMPOUNDS

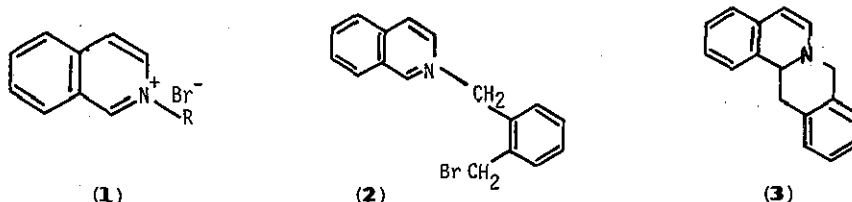
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Electrochemical reduction of onium salts of nitrogen heterocyclic compounds in the presence of alkyl halides was found to be a new versatile carbon-carbon bond formation method applicable to annelation reactions. The mechanism of this new C-C bond formation involves the reductive transformation of an onium salt to an anion followed by the attack of this anion to an alkyl halide.

Thus, cathodic reduction of 2-(2-bromomethylbenzyl)isoquinolinium bromide in DMF under the constant potential of 1.8 V vs. SCE gave an isoquinoline derivative through the expected annelation reaction.



Similarly, 2-(2-bromomethyl-3,4-dimethoxybenzyl)-3,4-dihydro-5,6-dimethoxyisoquinolinium bromide afforded xylopinine upon electroreduction. This electroreductive method could also be applied to syntheses of benzothiazolo[3,2-b]-isoquinoline derivatives (4) from 3-alkylbenzothiazolium salts (5).



The formation of laudanospine from 3,4-dimethoxybenzyl bromide and 2-methyl-3,4-dihydro-5,6-dimethoxyisoquinolinium salt in remarkably good yield clearly demonstrated the usefulness of this electroreductive method in the intermolecular C-C bond formation.