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Electrosynthesis of Benzothiazole Derivatives Using Sacrificial Electrodes

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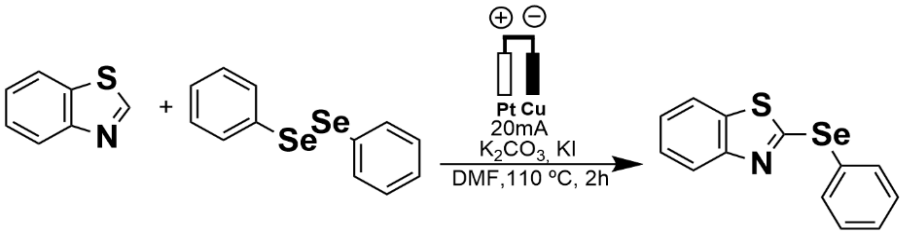
ABSTRACT

Benzothiazole derivatives have demonstrated remarkable biological activities, including anticancer, antimicrobial, and neuroprotective properties[1]. Electrosynthesis has proven to be an environmentally friendly and efficient approach for the chalcogenation of organic molecules[2].This project aims to develop an electrochemical methodology for the synthesis of benzothiazole derivatives (Scheme 1).

Scheme 1. Synthesis of Benzothiazole Derivatives using sacrificial electrodes.



Previous results indicated conversion yields ranging from 3% to 81%, as determined by NMR analysis. Reaction conditions were optimized (Table 1).

Table 1. Optimization of Reaction Conditions.

Entry	Solvent	Base (mmol)	Catalyst	Electrode	T (ºC)	t (h)	Yield (%)[a]
1	ACN	-	-	Pt:Pt	r.t	12	-
2	DMF	-	-	Pt:Pt	120	2	-
3	DMF	K_2CO_3 (0.75)	-	Pt:Cu	60	2	3%
4	DMF	K_2CO_3 (0.75)	-	Pt:Cu	120	2	41%
5	DMF	K_2CO_3 (0.75)	-	Pt:Cu	110	2	81%[b]

[a]Conversion by H NMR. [b]Reaction conditions: The base was added on the reaction when the temperature system was around 65ºC.

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