

The influence of the sacrificial anode nature on the mechanism of electrochemical arylation and alkylation of white phosphorus

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Abstract

The material of the sacrificial anode has a substantial effect on the nature and yield of the target products of electrochemical phosphorylation of organic halides by white phosphorus in the presence of the nickel complexes with 2,2'-bipyridine. The use of the zinc anode results in the products with tricoordinated phosphorus, viz., triorganylphosphines, the reaction on the aluminum anode affords triorganylphosphine oxides, and the presence of Mg²⁺ ions in the reaction mixture provides the transformation of white phosphorus into cyclic phosphines (PhP)₅.

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Keywords

2,2'-bipyridine, Electrochemical catalysis, Nickel, Organic halide, Sacrificial anode, White phosphorus, Zinc