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## Electrochemical characterization of pyrophosphate-based catalysts for the oxidation of furfural in aqueous phase

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### Abstract

Furfural, an important renewable, non-petroleum based chemical feedstock is basic chemical during various synthesis and can be obtained from a variety of agricultural byproducts. Maleic acid used in the synthesis of lubricants, plasticizers, resins, copolymers etc. can be alternatively prepared by the selective oxidation of biomass-based furfural. In this contribution copper–phosphate based catalysts with alkaline earth metals in their structure are characterized by abrasive linear sweep voltammetry at carbon paste electrode. The importance of phase composition on the catalyst selectivity and overall furfural conversion of the respective samples is also discussed. Based on the voltammetric results and catalytic performance of the individual copper based catalysts it is possible to conclude that the presence of Cu(I) plays an important role in the selectivity of the respective catalysts. The highest selectivity to the desired product of furfural oxidation (Maleic acid) was achieved in the case of  $\text{CaCuP}_2\text{O}_7$  with Ca:Cu = 1:1 ration. In the structure of this catalyst the highest

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