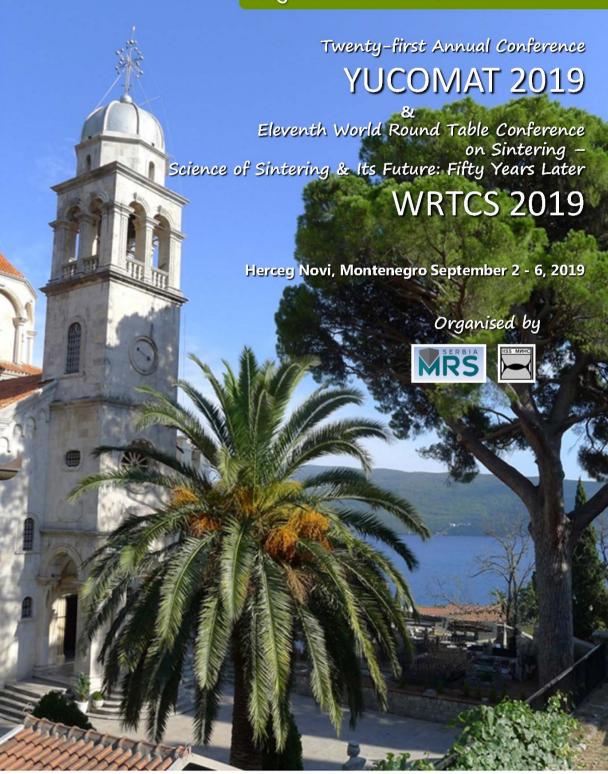
Programme & The Book of Abstracts

















Twenty-first Annual Conference YUCOMAT 2019

&

Eleventh World Round Table Conference on Sintering

WRTCS 2019

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Cost effective alloys based catalysts for alkaline fuel cells application

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Alkaline fuel cells (AFCs) have recently become attractive as environmental friendly future power sources. It was really important having in mind that in alkaline media less expensive non noble catalysts could be used. Namely, successful alkaline anion exchange membrane development enabled benefits of faster kinetics of oxygen reduction reaction in alkaline solutions.

In this study electrodeposited silver-palladium alloys of various composition were investigated and tested as the prospective catalysts for direct ethanol fuel cells application. All samples were characterized by scanning electron microscopy, energy dispersive spectroscopy, X-ray photoelectron spectroscopy, as well as by electrochemical techniques: cyclic voltammetry, polarization measurements at rotating disc electrode. The electrochemical active surface area was determined from the charge values corresponding to the reduction of Pd (II) oxide, assuming 420 μC for full oxide monolayer coverage. The optimal alloy composition showing the best catalytic activity for oxygen reduction and ethanol oxidation, with as much as possible lower content of Pd, was determined. It was found that it could be possible to obtain alloys containing only $\sim 20\%$ of more noble metal – palladium, showing high activity for both anode and cathode reaction. The stability testing gave very promising results, as well.

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