Design and Simulation of Mems based Piezoelectric Acoustic sensor

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S. Veena ; Deepika ; Vasudha Hegde ; Veda Sandeep Nagaraj ; H. L Suresh ; M.A. Gautham **All Authors**

Abstract:A MEMS based acoustic sensor that combines high sensitivity, wide frequency range and low cost batch processed miniaturized silicon components to build self powered syste... **View more**

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Abstract:
A MEMS based acoustic sensor that combines high sensitivity, wide frequency range and low cost batch processed miniaturized silicon components to build self powered systems is presented in this paper. It also throws light on an effective method to monitor health of a machine which is by using an piezoelectric Mems microphone. The proposed Acoustic sensor consists of a sputtered piezoelectric ZnO layer that transforms the mechanical deflection of a thin-etched-Si diaphragm into a piezoelectric charge. This ZnO layer is sandwiched between bottom Al electrode and top Al electrode. The simulations of the proposed acoustic sensor is carried out for two designs i) The piezoelectric material being placed at the 4 corners of the silicon substrate and ii) The piezoelectric material being placed at centre of the silicon substrate. The thickness of the layers are chosen so as to withstand the dynamic sound pressure of 96-106db and it produces maximum of 8pV/Pa. The simulation is done by Comsol multiphysics and Coventorware.

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Electrochemical behaviour of Heat treated Al 356 Alloy using N2-phenyl-1, 3, 5-triazine- 2, 4-diamine compound in 3.5% NaCl solution

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Abstract

In the present research work corrosion behavior of heat treated Al 356 alloy was studied using 3.5% NaCl solution as corrosion medium in different concentration of inhibitor N2-Phenyl-1, 3, 5-Triazine- 2, 4-Diamine. Rectangular specimen of dimensions 2cm x1cm x1mm were machined from Al 356 alloy. Specimens were subjected heat treatment for 2h, 3h, 4h, 5h & 6 hours in muffle furnace at 550 ^{o}C. Specimens were subjected to potentiodynamic polarization studies and electrochemical impedance studies using electrochemical work station model CH 608E series manufactured by CH Instruments, USA. The results obtained were compared with that of non-heat treated specimen. It was found that the heat treated specimens exhibit excellent corrosion resistance when compared to no- heated specimen.

Catalytic activity of Silver nanoparticles: a critical review

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Metal nanoparticles are preferred in industrial applications due to their stability and unique ability. One of the major areas of application of nanoparticles is catalysis due to specificity, efficiency and recovery of the catalyst. Among the metal nanoparticles, nanosilver is used in many reactions as catalyst. These nanoparticles are used in biological and chemical reactions as dye degradation, oxidation reactions, enzymatic reaction, antimicrobial activity etc. It is also observed that there is a size and concentration dependent catalytic activity of these silver nanoparticles. This review is critically focussed on the conditions and parameters affecting the catalytic nature of the silver nanoparticles. Therefore silver nanoparticles can be used as an efficient catalyst in differ reactions. Key words: Silver Nanoparticles, Catalyst, chemical and biological reaction

Performance Evaluation of Nature Inspired Algorithms for MPPT in Solar PV Systems with Partial Shading

Publisher: IEEE

R Subha. ; S Himavathi. **All Authors**

Abstract: Nature inspired algorithms have been found to be powerful in solving complex optimization problems due to the intelligence embedded in them. Some of these algorithms have... **View more**

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Abstract:
Nature inspired algorithms have been found to be powerful in solving complex optimization problems due to the intelligence embedded in them. Some of these algorithms have also been used in tracking the maximum power point (MPP) in a partially shaded photovoltaic (PV) array. This paper evaluates the capability of five algorithms inspired from nature in tracking maximum power point under partial shading. The performance of the algorithms are compared in terms of their tracking accuracy, convergence time and implementation complexity to find the most suitable method for MPP tracking.

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