

Impedance Behaviour of a Microporous PMMA-Film 'Coated Constant Phase Element' based Chemical Sensor

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Abstract-In this work, it has been attempted to characterize a new type of impedance sensor called constant phase element (CPE) sensor; which has microporous PMMA-₋Im coating on the electrode surface. It has been shown that the 'constant phase angle (CPA)' behaviour is primarily due to the porous structure of the electrode surface. And the phase angle at the output of the sensor changes with thickness variation of the PMMA coating and ionic property of the medium in which the sensor is dipped in. The sensor has been used for chemical sensing. A phase angle detector circuit gives the output in voltage with the change in the phase angle. The complex impedance plots of the probes has also been discussed. The important fact is that the constructed CPE gives rise to a fractional order system.

Key word: Chemical sensor, constant phase element, fractional order system, phase detector circuit.