

## Performance Degradation Study of DMFC by In-Situ Methanol Oxidation and Electrochemical Impedance Spectroscopy

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Performance degradation of direct methanol fuel cell was observed by keeping at a constant current density of  $150 \text{ mA/cm}^2$  and  $55 \text{ }^\circ\text{C}$  for 435 hours. Maximum power density decreased to 71, 57 and 50 % of initial value after operation for 145, 290 and 435 hours, respectively. In-situ methanol oxidation activity was measured before and after stability test, where activity decrease by 8 % was observed. To separate contributions of each component on the degradation, electrochemical impedance spectroscopy was used. In anode measurement, IR resistance increase was dominant and anode resistance increase was 11 % of total resistance increase. In full cell measurement, we found out that increase of reaction resistance was 30 % of total increase. Therefore, we could conclude that the contribution of each components was in order of IR resistance, cathode resistance and anode resistance.