Supporting Information

Single Wall Carbon Nanotube Supports for Portable Direct Methanol Fuel Cells

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Figure S1: Cyclic voltammetric trace of CFE/SES-SWCNT/Pt-Ru electrode in 0.1 M H₂SO₄ recorded at 25 °C at a scan rate of 50mV/s. The initial scan in the forward direction (-0.1V - 1.0Vvs SCE) indicates the CO stripping peak followed by the subsequent cathodic/anodic cycles showing H₂ adsorption/desorption.

FigureS2: Scanning electron micrograph showing carbon fiber electrode (CFE) deposited with Johnson Matthey Carbon black support and Pt-Ru at low magnification (A) and high magnification (B&C). Magnifications used in each case are shown on the respective images.

FigureS3: Potential dependant impedance spectra for methanol oxidation in Nyquist form for CFE/Carbon black/Pt-Ru electrode. Here curves A-F correspond to variation of the potential from equilibrium value: A) 0 mV, B) 300, C) 400, D) 500, E) 600 and F) 700 mV vs SCE. Trace G shows the variation of the charge transfer resistance for the carbon black electrode with potential. The electrolyte was 1M methanol in 1M H_2SO_4 . The Pt-Ru loading was $0.2mg/cm^2$ and the amount of carbon support is $\sim 0.5mg/cm^2$ in each case.

Figure S4: Frequency dependant impedance spectra for methanol oxidation in Bode form for CFE/Carbon black/Pt-Ru electrode. S4A shows the dependence of phase angle on the frequency while S4B shows the dependence of the magnitude of impedance on the frequency. In both figures, curves a-f corresponds to variation of the potential from equilibrium value: a) 0 mV, b) 300, c) 400, d) 500, e) 600 and f) 700 mV vs SCE. The inset in Figure S4A shows the variation in phase angle with potential for the carbon black electrode.

FigureS5: Membrane electrode assembly (MEA) consisting of nanostructured carbon support (left) and portable air breathing DMFC unit (right) employed in the present study