

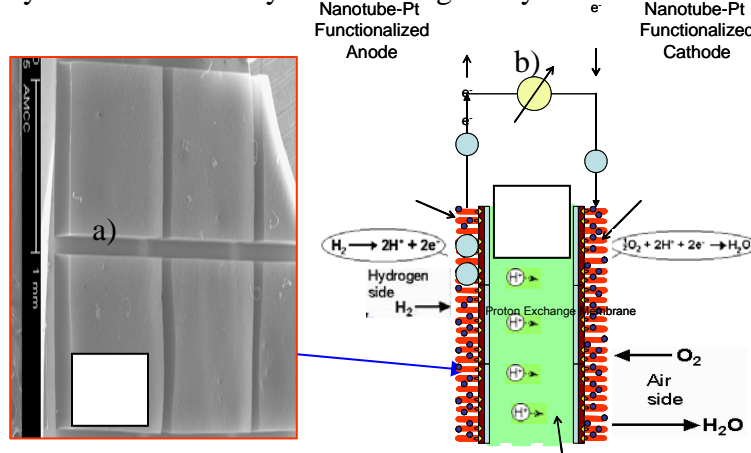
## PEM/Low Temperature Fuel Cells

V. Shanov and M. Schulz (CME, MINE):

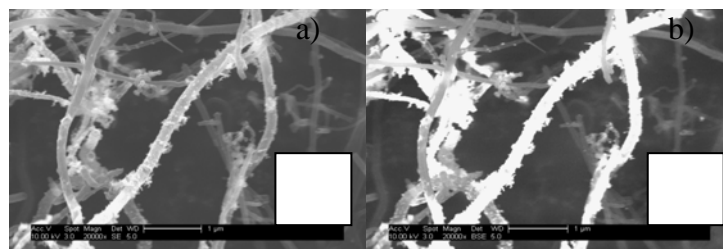
**Objectives:** The primary goal of the research will be to develop functionalized nanotube arrays as electrodes for PEM fuel cells.

**Approach:** Novel electrode materials are needed for improving the current PEM fuel cells. Carbon nanotube arrays decorated with Pt nanoparticles are expected to serve better and longer as electrodes compared to the current carbon/Pt electrodes. The following will be done to achieve this goal utilizing the demonstrated ability in synthesizing CNT arrays.

- Taking advantage of the huge carbon nanotube (CNT) surface area, their controlled porosity, good electrical conductivity, and ability to be functionalized or decorated with different ions, elements and compounds-(Fig. 2)
- Using dry and wet chemistry for attaching catalyst elements for PEM electrodes-(Fig. 3)



**Fig. 2.** a) carbon nanotube array grown at UC, b) concept nanotube array electrode for PEM fuel cell.



**Fig. 3.** Functionalized at UC carbon nanofibers (CNF) PR-24 with metal particles; a) secondary electron image of decorated CNFs, b) backscattered image of decorated CNFs