PLATINUM DEPOSITION OF PURIFIED CARBON NANOTUBE PAPERS FOR USE IN PROTON EXCHANGE MEMBRANE FUEL CELLS. ***C. Schauerman,*** *H. Ruf, B. Landi, R. Raffaelle*, Department of Physics, Nanopower Research Laboratories, cms3176@rit.edu, rprsps@rit.edu.*

The use of Pt-supported carbon nanotube papers, both single walled and multi walled, is under investigation for catalytic electrodes in proton exchange membrane (PEM) fuel cells. Single walled nanotubes are synthesized using an Alexandrite laser vaporization process from Ni/Co doped graphite targets at 1050 ºC and 700 Torr. Multi walled nanotubes are synthesized in a chemical vaporization deposition reactor from a cyclopentadienyliron dicarbonyl dimer precursor at 725 ºC and under a 0.75 L/min flow of Ar. Purification of the raw SWNT soot is achieved through a combination of acid and thermal oxidation procedures with necessary solvent washes to remove carbonaceous impurities. Deposition of Pt on the SWNT papers occurs through DC sputtering in an Ar plasma with deposition rates controlled by chamber pressure and applied voltage. Characterization of the Pt- supported carbon nanotube paper is performed by UV-VIS-NIR spectroscopy, thermal gravimetric analysis (TGA), scanning electron microscopy (SEM), Raman spectroscopy, and electron dispersive x-ray spectroscopy (EDS). Evaluation of the catalytic electrode performance for each Pt- supported carbon nanotube paper as both the anode and cathode is accomplished by galvano-static testing in a PEM fuel cell assembly at 25 ºC and 1 atm O_2/H_2. The effects of Pt loading and carbon nanotube purity on the fuel cell performance is investigated for maximum power output.