Electronic Supplementary Information for

Molecular Interactions of Polyimides with Single-Walled Carbon Nanotubes

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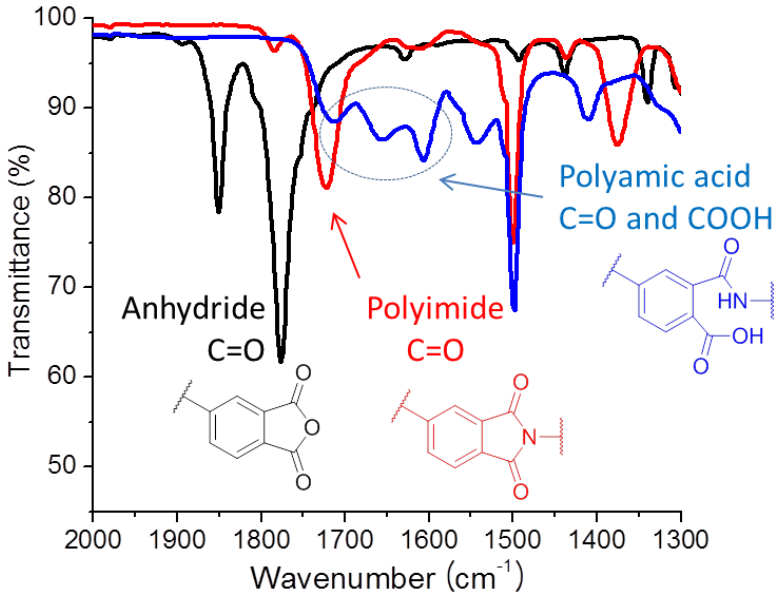

Fig. S1 FT-IR spectra for polyamic acid (blue) and polyimide (red) from the reaction of 6FDA and ODA. The spectra confirm the imide formation.

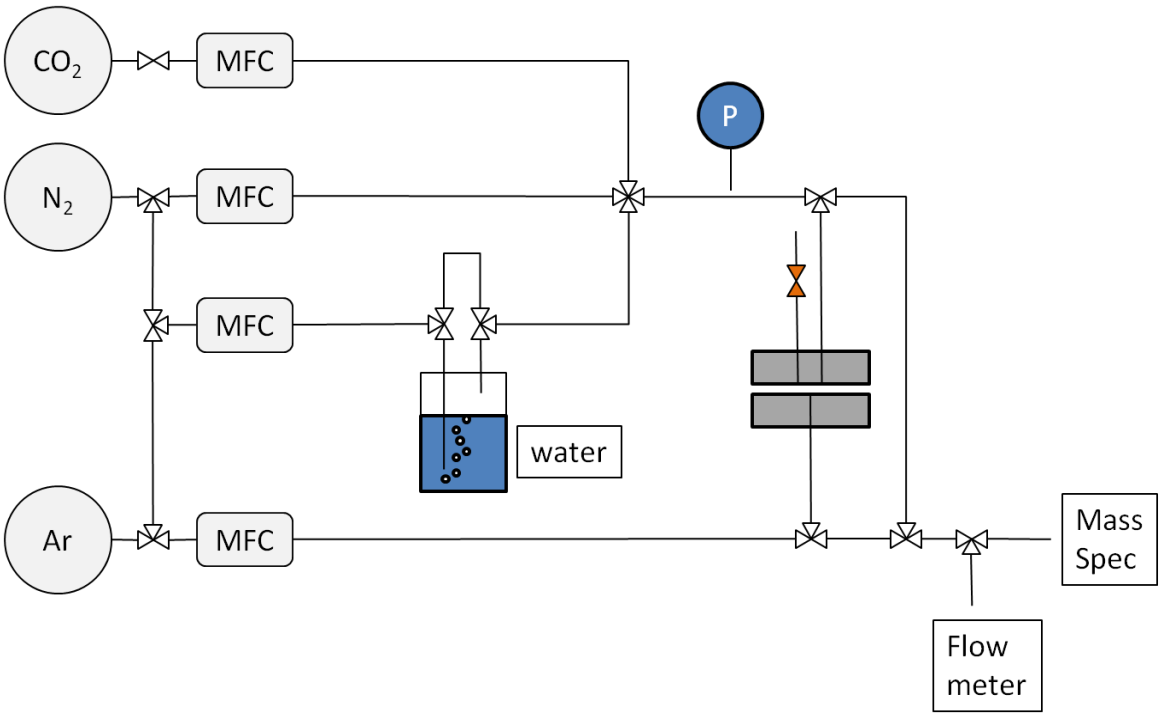

Fig. S2 Gas permeation test setup. The pressure on the feed side was regulated with a back pressure control valve. Ar was used as a sweep gas at the permeate side, and the permeation flow rates were analyzed using the mass spectrometer with a real time gas analyzer.

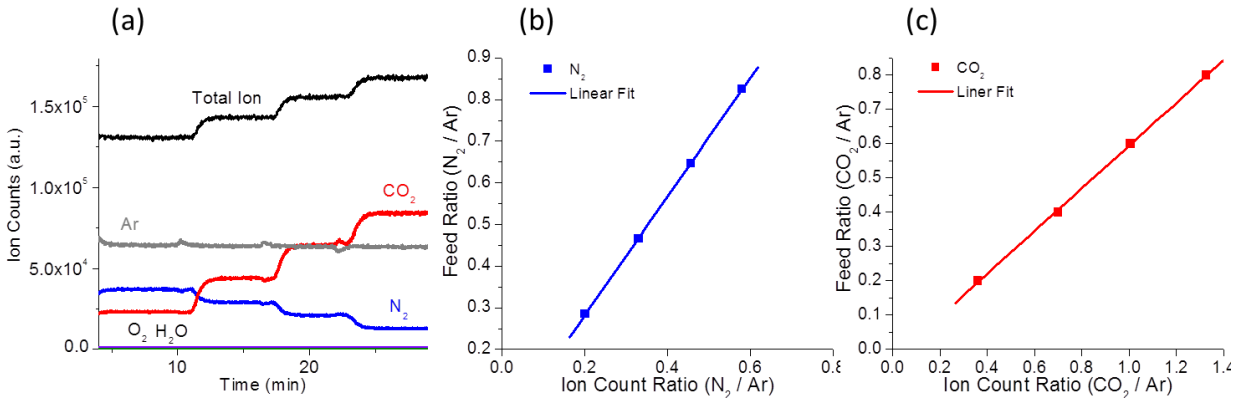

Fig. S3 Mass spectroscopy calibration according to gases. The flow rate of Ar was set to 30 sccm and those of N_2 and CO_2 were changed to specific values, and then the mass spectrometer counted the ion intensities of all gases (a). Feed ratios of N_2 over Ar (b) and CO_2 over Ar (c) were plotted with respect to the ion count ratios, respectively. The slopes were used to calculate the gas flow rates out of ion counts at the constant Ar flow rate.

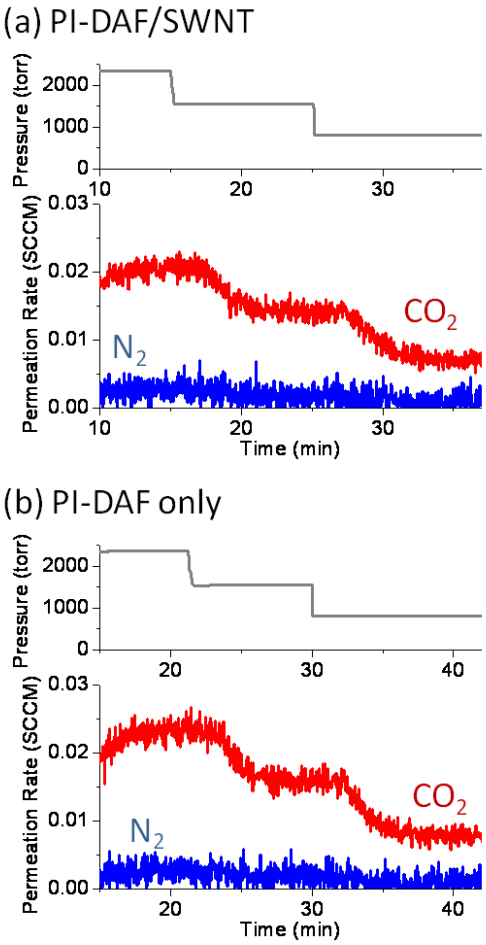

Fig. S4 Gas permeation through a PI-DAF/SWNT membrane (a) and a control membrane, PI-DAF only (b), measured by mass spectroscopy under different feed pressures. They show higher permeability of CO_2 (red curve) over N_2 (blue curve). The feed mixture has 53.5 % of N_2 and 46.5 % of CO_2, and the pressure of the feed stream is presented at the top. The membrane has an effective area of 3.8 cm^2 with a thickness of 32 μm.