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Oxygen transport through polyethylene terephthalate (PET) coated with plasma-polymerized acetylene at atmospheric pressure ERIK WEMLINGER, PATRICK PEDROW, MANUEL GARCIA-PÉREZ, SHYAM SABLANI, Washington State University — Moser et al. have shown that oxygen transport through polyethyleneterephthalate (PET) is reduced by a factor of up to 120 when, at reduced pressure, hydrogenated amorphous carbon film with thickness less than 100 nm is applied to the PET substrate.[1] Our work includes using atmospheric pressure cold plasma to grow a plasma-polymerized acetylene film on PET substrate and measuring reductions in oxygen transport. The reactor utilizes corona discharges and is operated at 60 Hz with a maximum voltage of 10 kV RMS. Corona streamers emanate from an array of needles with an average radius of curvature of 50 μm. The reactor utilizes a cylindrical reaction chamber with a vertical orientation such that argon carrier gas and acetylene precursor gas are introduced at the top then pass through the cold plasma activation zone and then through a grounded stainless steel mesh. Acetylene radicals are incident on the PET substrate and form plasma-polymerized acetylene film.

[1]E.M. Moser, R. Urech, E. Hack, H. Künzli, E. Müller, *Thin Solid Films*, 317, 1998, pp. 388-392.

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