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## High rate deposition and mechanical properties of SiO<sub>x</sub> film on PET and PC polymers by PECVD with the dual frequencies UHF and HF at low temperature

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The design and implementation of high rate deposition process and anti-scratch property of silicon oxide film by PECVD with UHF power were investigated according to the effect of UHF input power with HF bias. New regime of high rate deposition of SiO<sub>x</sub> films by hybrid plasma process was investigated. The dissociation of OMCTS (C<sub>8</sub>H<sub>24</sub>Si<sub>4</sub>O<sub>4</sub>) precursor was controlled by plasma processes. SiO<sub>x</sub> films were deposited on polyethylene terephthalate (PET) and polycarbonate substrate by plasma enhanced chemical vapor deposition (PECVD) using OMCTS with oxygen carrier gas. As the input energy increased, the deposition rate of SiO<sub>x</sub> film increased. The plasma diagnostics were performed by optical emission spectrometry. The deposition rate was characterized by alpha-step. The mechanical properties of the coatings were examined by nano-indenter and pencil hardness, respectively. The deposition rate of the SiO<sub>x</sub> films could be controlled by the appropriate intensity of excited neutrals, ionized atoms and UHF input power with HF bias at room temperature, as well as the dissociation of OMCTS.