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**Development of Flexible Dye-Sensitized Solar Cells** XIAOJUAN FAN, Marshall University — We are developing a low cost and easy process to fabricate porous metal oxide thin films on flexible substrate for high performance dye-sensitized solar cells (DSSCs). The research addresses on the formulation of $TiO_2$ precursor to create smooth and continuous porous thin films on large size plastic or metal foil substrates enabling excellent adhesion, robust mechanics, and chemical stability. The porous nanocrystalline $TiO_2$ thin films are used as anode electrodes for attaching light sensitizers. The first trial is to blend a polymer to Ti alkoxide precursors at various concentrations. After depositing the mixture on the substrates, the substrates are baked, exposed to UV light, taken place wet or dry etch to remove polymers leading to a porous structure. An appropriate annealing process will be applied to $TiO_2$ to turn it into crystalline. Alternative low temperature annealing method including steaming hydrothermal, plasma etches, and UV-ozone treatment will be tested with the annealing process controlled at low temperature.

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