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Atmospheric Pressure Chemical Vapor Deposition of Functional Oxide Materials for Crystalline Silicon Solar Cells

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Collaboration with: SCHMID

Functional Oxide Materials

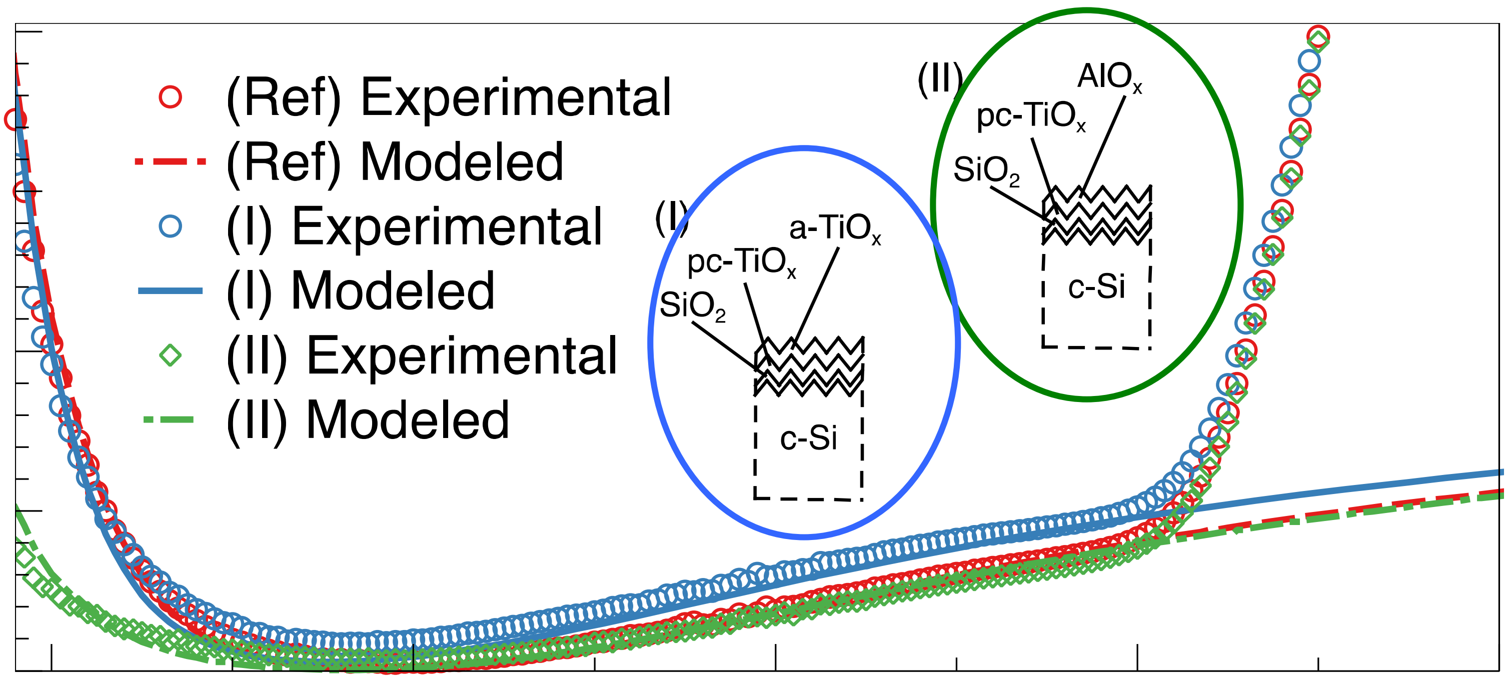
- In-line APCVD used to deposit the materials below
- Different functionalities within c-Si solar cells were explored

Oxide Material	
B)	• Boron dopant source and surface passivation layer

All-Oxide DLARCs vs. SiN_x

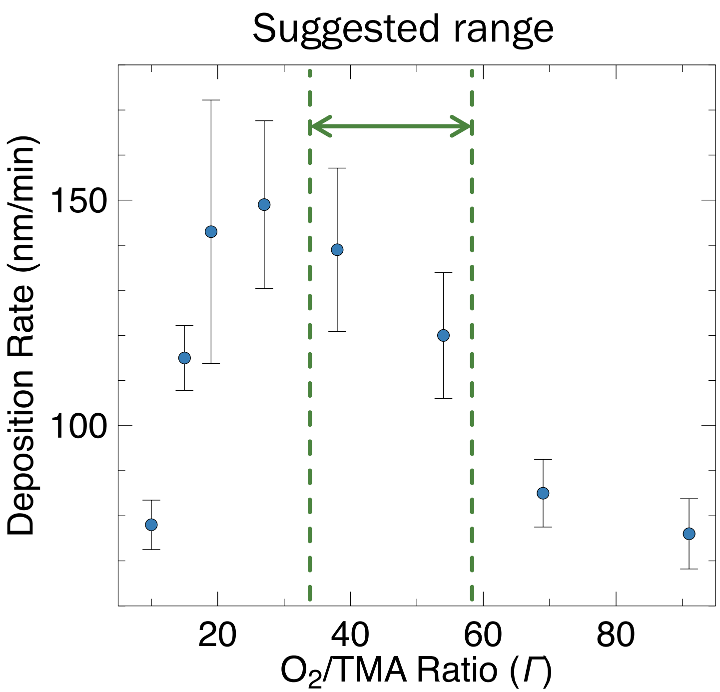
- Results: SiO_2 passivated stacks vs. SiN_x

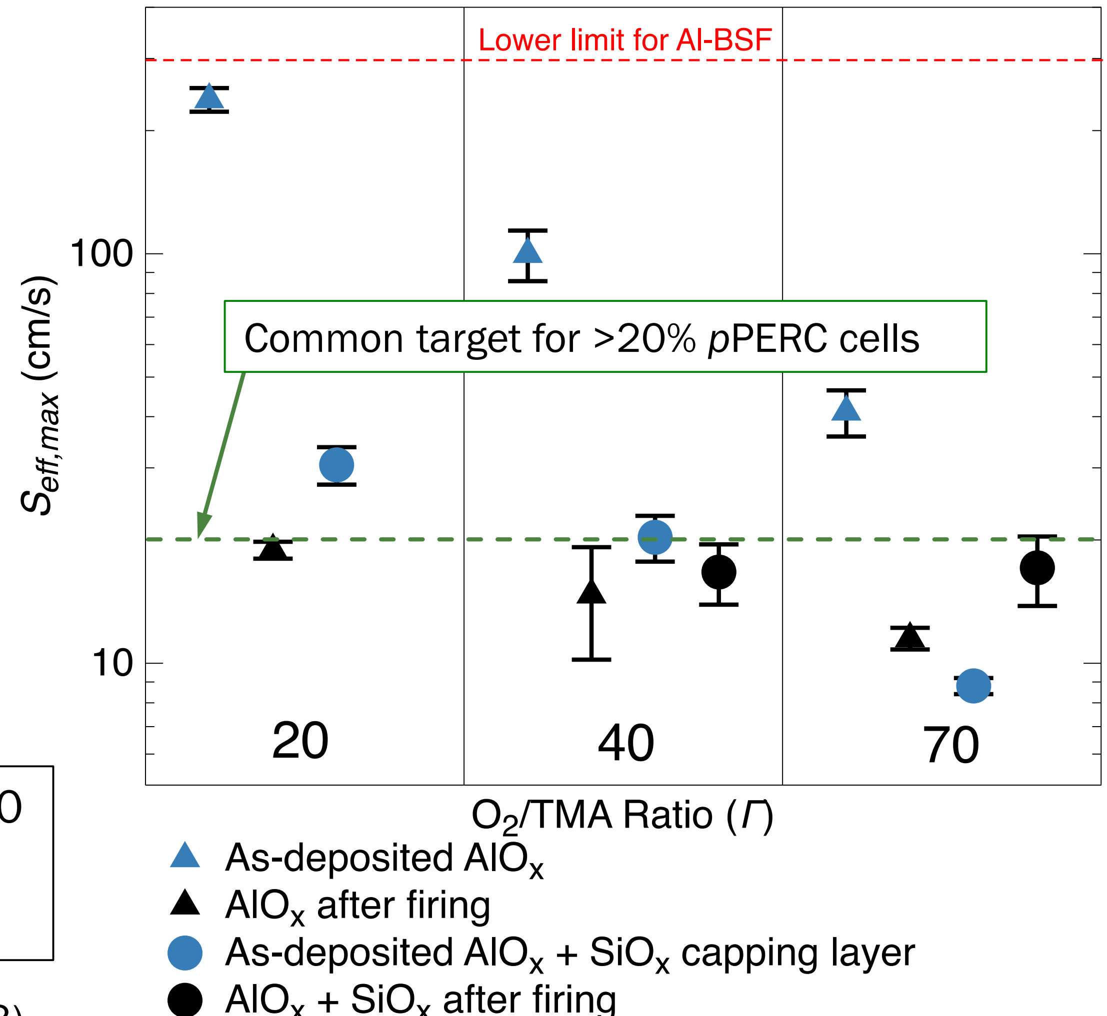
(a)



K.O. Davis *et al.*, *IEEE JPV* (2015), accepted.

Surface Passivation via AlO_x



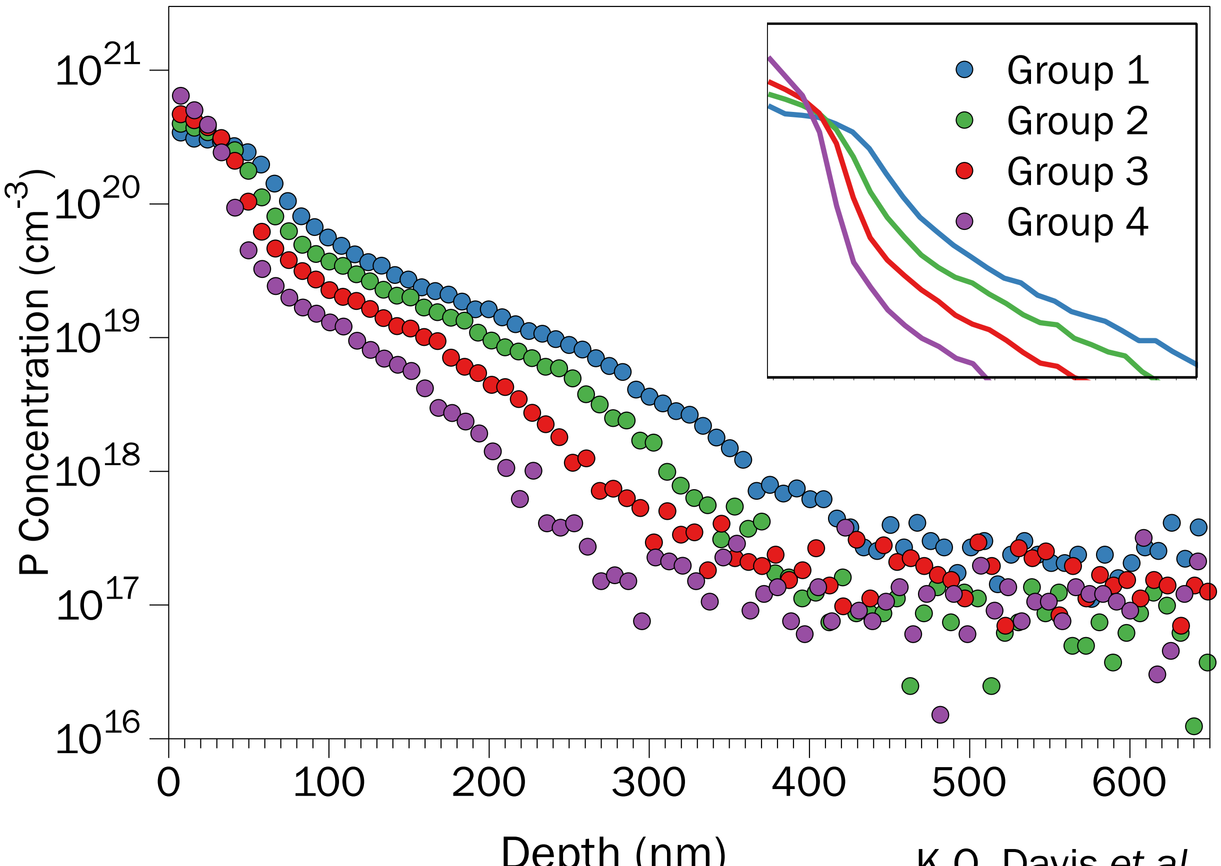


Optimum O_2/TMA ratio in the 35-60 range based on performance vs. throughput tradeoff.

K.O. Davis *et al.*, *pss-RRL* (2013).

Phosphorus Doping via PSG

- SIMS depth profiles for four groups with equivalent sheet resistances ($R_{sheet} \approx 60\ \Omega/\Box$)



K.O. Davis *et al.*, *pss-RRL* (2013).