

Previous Status Quo

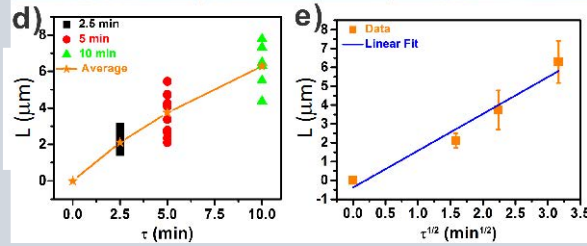
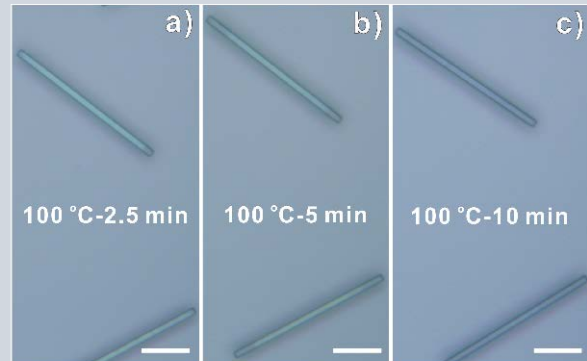
- VO₂ has metal-insulator transition near room temperature.
- Atomic H dopes VO₂ and suppresses the metal-insulator transition.

New Insights

Kinetics of the diffusion of H within VO₂ found to be highly anisotropic, and much faster in the metal phase than the insulator.

Project Details

- H diffuses rapidly along rutile c axis – in from the ends of nanowires.



- H diffuses microns in minutes in metallic state, undetectably in tens of min. in insulating state.

Challenges

- Potentially useful as switchable, semipermeable H membrane, but need textured VO₂ films.
- Don't know role of strain in kinetics.

Next Steps

- Collaborate w/ film growers to make and study such films.
- Also quantify Li intercalation and transport!

