Supplemental figure for

Self-referencing photothermal common-path interferometry to augment ellipsometry in low-loss membranes

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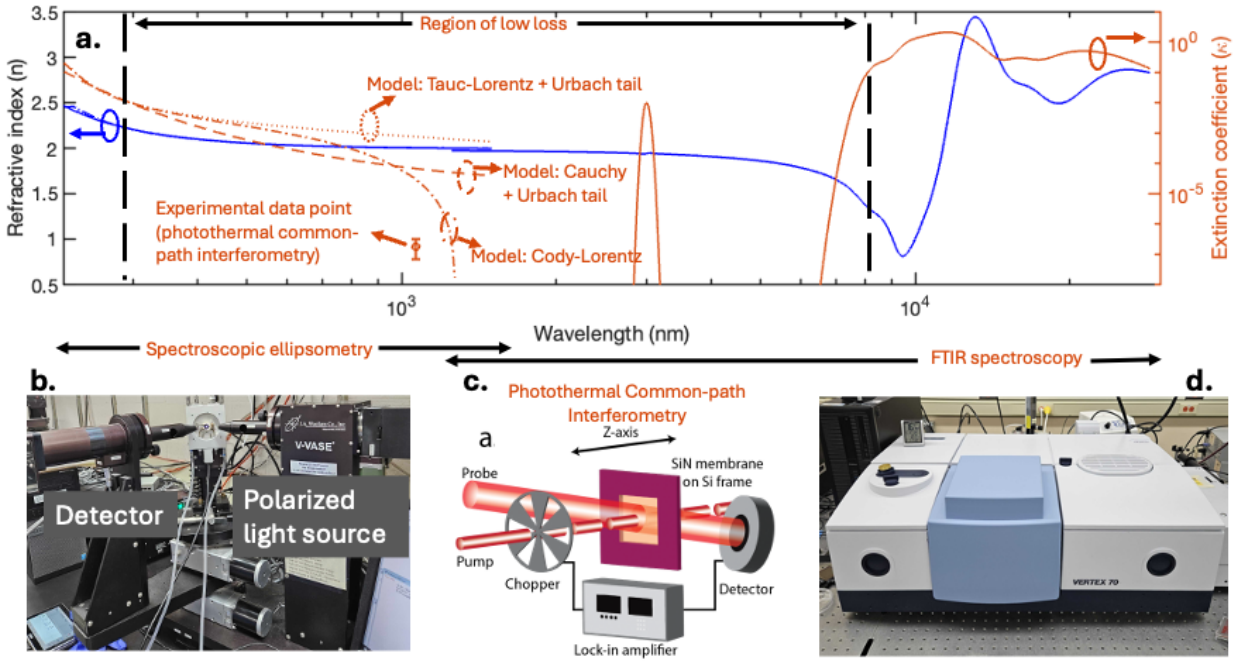

Supplemental figure (a) Combined optical constants for stoichiometric Si_3N_4 derived from our experiments using UV-Vis-NIR ellipsometry (230 nm – 2500 nm), mid-IR FTIR spectroscopy (2100 nm – 16 µm), and photothermal common-path interferometry (PCI) at 1064 nm. Ellipsometry and FTIR spectroscopy are fast, convenient, and broadband instruments, but are limited in the measurement of loss in low-loss materials. PCI is a sensitive pump-probe technique capable of sub-ppm-level absorption measurements for a particular wavelength. For stoichiometric Si_3N_4, the low loss region where ellipsometry and FTIR spectroscopy are not sensitive enough to measure loss is from ~300 nm to ~7 µm; estimates of the extinction coefficient vary greatly in this range depending on the oscillator model used. The extinction coefficient measured for a 200-nm-thick Si_3N_4 membrane using PCI at 1064 nm is shown, which can help pin down the correct model to estimate loss in the low loss region. Experimental setup schematics and photographs for **(b)** ellipsometry, **(c)** photothermal common-path interferometry, and **(d)** FTIR spectroscopy