

Separating delivery history from apparent reaction rates

ABSTRACT

Delivery and acquisition dynamics can be misread as changes in surface chemistry. This completed, dimensionless synthetic study compares single-pole and finite-buffer inlet histories, then tests rate inference with averaged or point-sampled observations. Stored dose and acquisition mismatch produce distinct inference errors. The matched, noiseless case is a recovery control. The comparison motivates independent inlet and sensor characterization; it does not establish measured ALD kinetics or film growth.

MODEL-TO-EVIDENCE SEQUENCE



Delivery history changes what reaction rates appear to mean

ALD half-reaction model | Original dimensionless synthetic study



Figure 1 | Delivery and observation effects in a synthetic ALD model. (a) Instantaneous inlet histories. (b) Initial surface-state conversion. (c) Inferred rate multipliers; the reference is 1 and the imposed upper bound is 3. (d) Worst scaled RMSE across two held-out histories on a linear axis. All fitted delivery models are single-pole models. Channel weights are numerical scales, not measured noise. The original four-panel figure is reproduced without changing its data. Conversion is not thickness or growth per cycle.

AUTHOR QUERY / BEFORE PHYSICAL INTERPRETATION

Which independent inlet and sensor measurements would separate stored-dose effects from reaction kinetics? Confirm the acquisition model and retain the stated model limits before extending the claim.