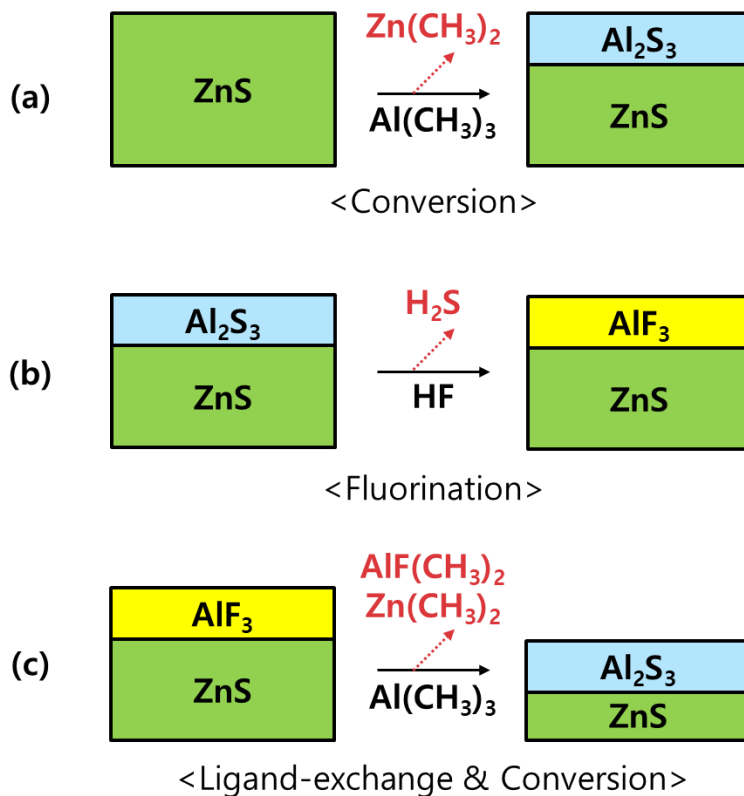
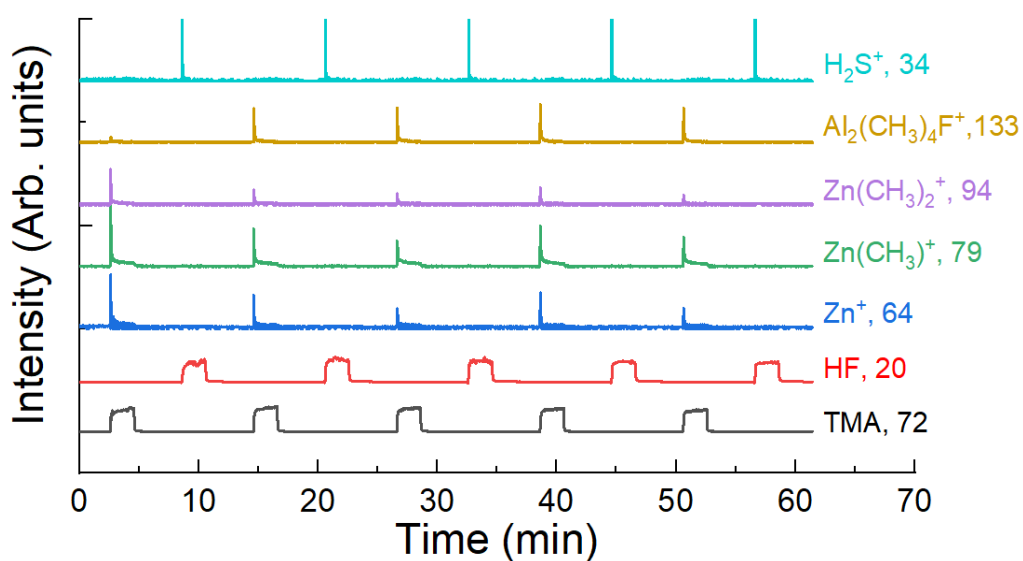


## Thermal Atomic Layer Etching of Zinc Sulfide (ZnS) Using Sequential $\text{Al}(\text{CH}_3)_3$ and HF Exposures

Taewook Nam, Jonathan L. Partridge, Jessica A. Murdzek and Steven M. George  
Department of Chemistry, University of Colorado Boulder, CO 80309, USA



**Figure 1.** Estimated mechanism of ALE ZnS. (a) Conversion of ZnS by the reaction with  $\text{Al}(\text{CH}_3)_3$ , (b) fluorination of  $\text{Al}_2\text{S}_3$  by the reaction with HF, and (c) ligand exchange of  $\text{AlF}_3$  and conversion of ZnS by the reaction with  $\text{Al}(\text{CH}_3)_3$ .



**Figure 2.** Time-resolved quadrupole mass spectrometer result of ALE ZnS during  $\text{Al}(\text{CH}_3)_3$  and HF exposure at 275 °C