Main group metal catalysis is of great current interest due to its potential to circumvent the high cost and toxicity of common transition metal catalysts. One of the major hurdles in this area is the lack of oxidative additions of robust \( \sigma \) bonds (e.g. H‒X, C‒X, P‒P, S‒S) to main group centres.\(^1\)\(^,\)\(^2\)\(^,\)\(^3\)\(^,\)\(^4\) However, recent work has demonstrated the ability of low valent main group compounds to mimic transition metal complexes in the cleavage of strong single bonds.\(^2\) We have recently reported facile activation of H‒X bonds (where X = H, B, Al, C, Si, N, P, O) by the \( \beta \)-diketoiminoate stabilized complex of aluminum in the +1 oxidation state, \( \text{Al}^{\text{I}} \).\(^5\) We have since extended the scope of bond activations to other single bonds including carbon–oxyen, carbon–sulfide, and carbon–halide as well as element–element bonds in disulfides and diphosphines.\(^6\) Complex \( \text{Al}^{\text{I}} \) is able to oxidatively add the very robust C-F bonds in aryl and alkyl fluorides.\(^7\) We are now very well positioned to cleave multiple bonds X=Y (X=C, P; Y=S, N, O).\(^8\)

I shall also discuss our efforts to prepare zero-valent main-group complexes.\(^9\)

![Diagram](image_url)

**References**