Description of Additional Supplementary Files

File Name: Supplementary Video 1
Description: Representative molecular dynamics simulation of KVO_3 at T = 500 K starting from the perovskite structure

File Name: Supplementary Video 2
Description: Connection between the perovksite phase and the KVO_3-type structures as computed with the nudged elastic band method.

File Name: Supplementary Video 3
Description: Evolution of the crystal structure, energy, and polarisation of KVO_3 as it evolves from the ZZ-A antipolar ground state to the ZZ-F polar phase.