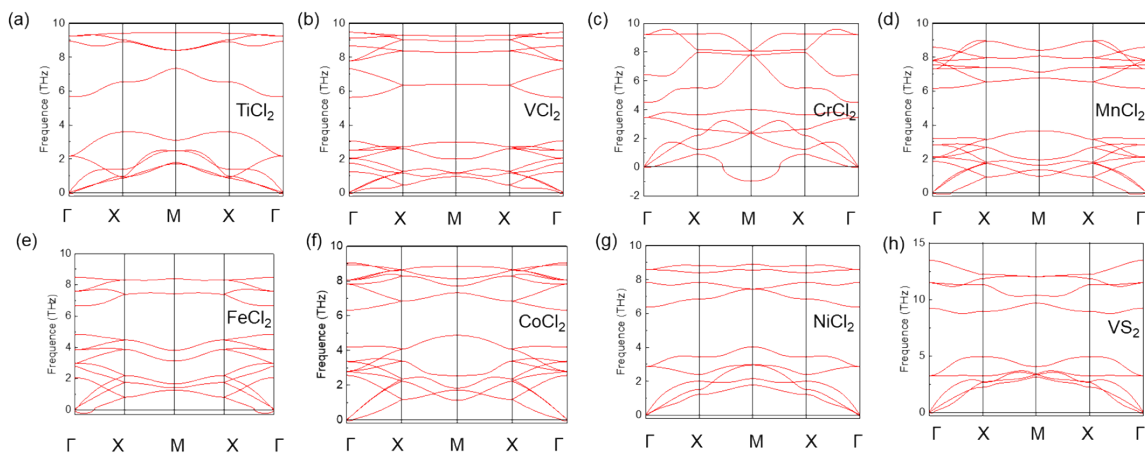


## Supporting information



**Fig. S1** Calculated phonon dispersion of  $\text{MX}_2$  (a)  $\text{TiCl}_2$  (b)  $\text{VCl}_2$  (c)  $\text{CrCl}_2$  (d)  $\text{MnCl}_2$  (e)  $\text{FeCl}_2$  (f)  $\text{CoCl}_2$  (g)  $\text{NiCl}_2$  (h)  $\text{VS}_2$ . The results demonstrate that  $\text{MX}_2$  are dynamically stable. The small acoustic imaginary mode nearby  $\Gamma$  point, which is considered as the instability against long-wavelength transverse waves, not significantly affect the crystal structure.