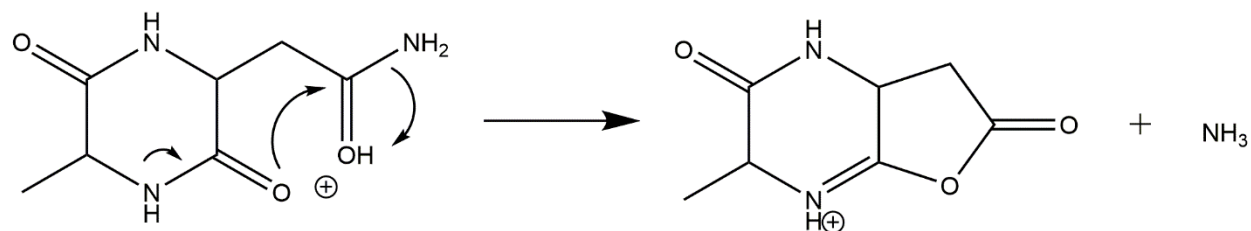


Supporting Information

a)



b)

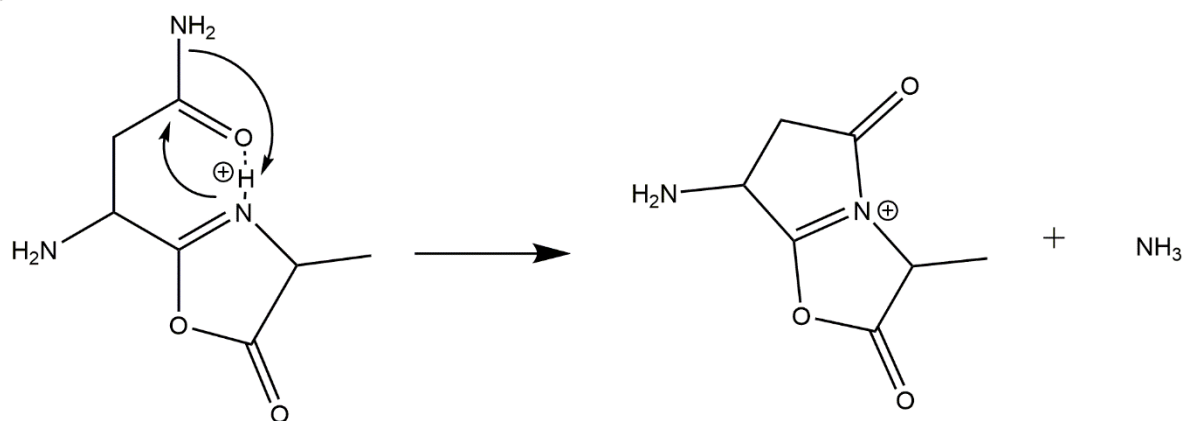


Figure 1: Proposed mechanisms for the formation of the NA $\text{b}_2\text{-NH}_3$ from a) the diketopiperazine structure and b) the oxazolone structure.

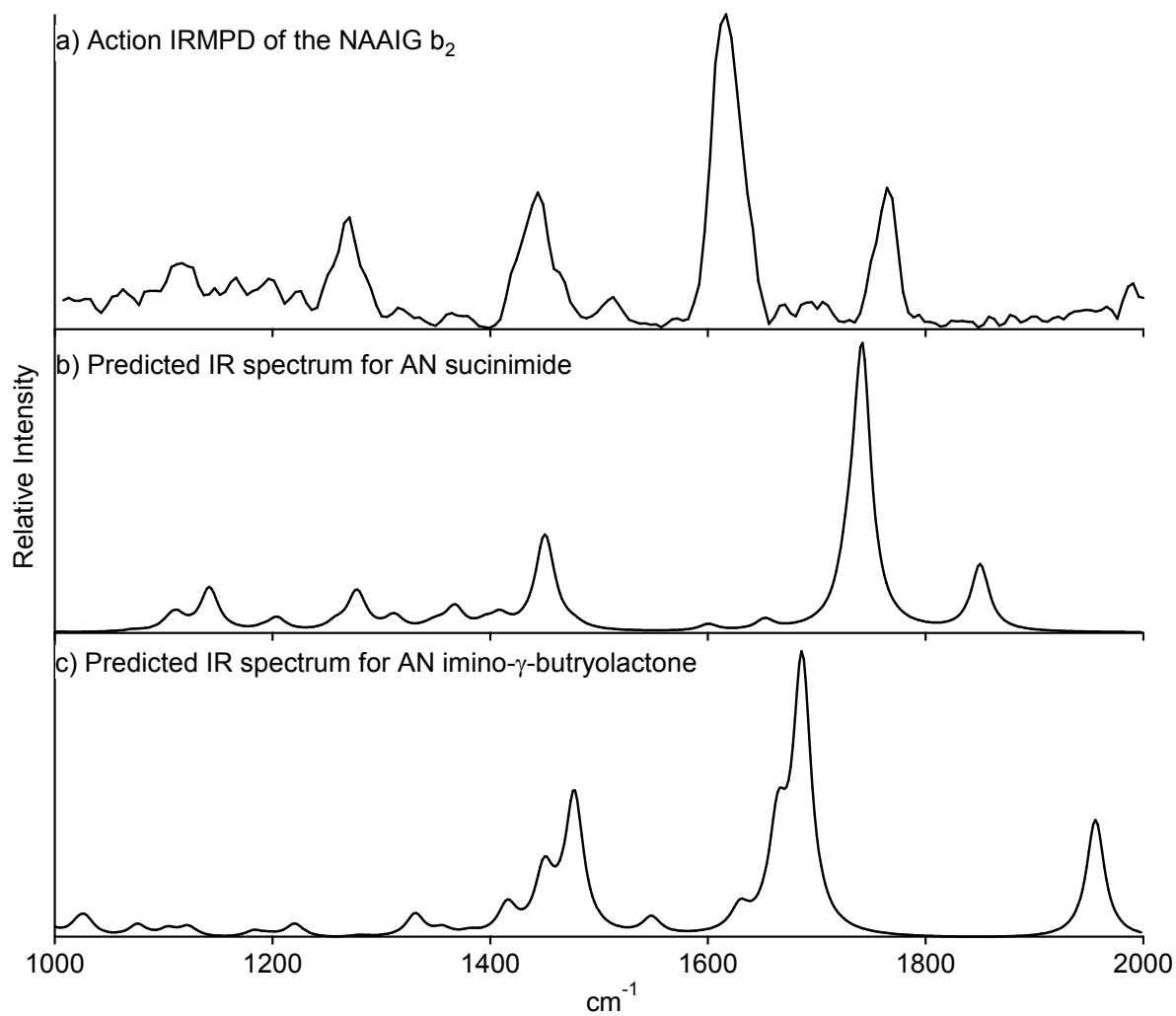


Figure 2: The action IRMPD spectrum of the NAAIG b_2 is shown in a) in comparison to the predicted IR spectra for an AN succinimide and imino- γ -butyrolactone structure.

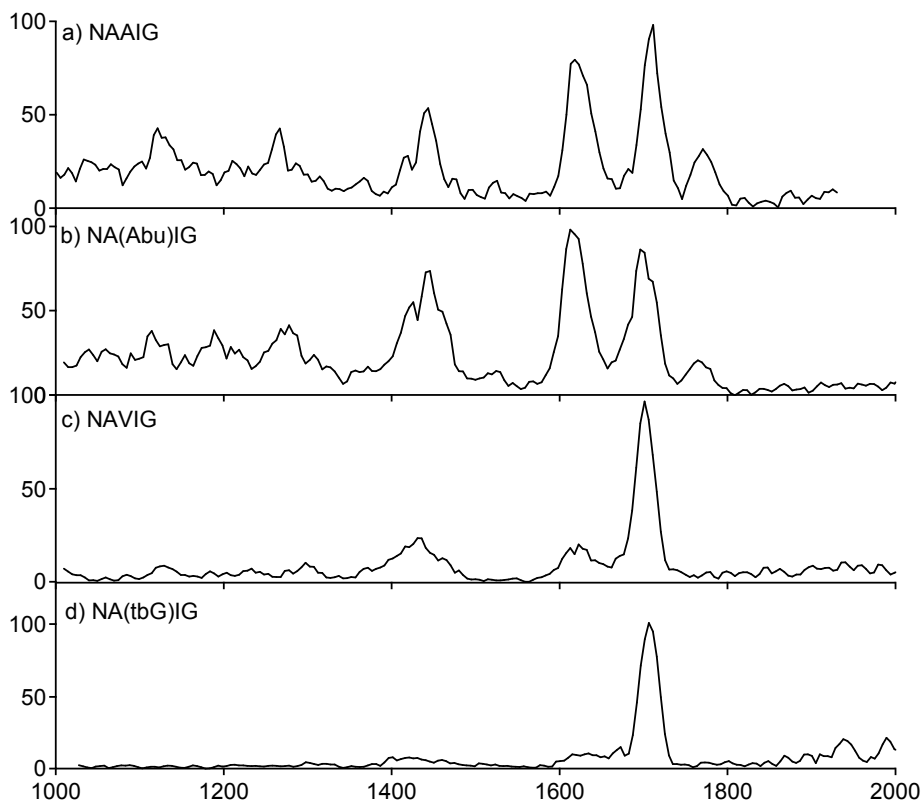


Figure 3: Action IRMPD spectra of the b_2 from a) NAAIG, b) NA(Abu)IG, c) NAVIG, and d) NA(tbG)IG using 200V in-source CID to generate the b_2 species.