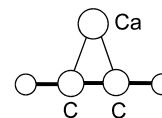
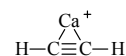


205  
LIF $\text{C}_2\text{H}_2\text{Ca}^+$ **( $\eta^2$ -Ethyne)calcium (1+) ion**  
Acetylene – calcium (1+) ion $\text{C}_{2v}$ 

State	$\tilde{X}^2A_1$	$\tilde{A}^2B_1$
Energy [eV]	0.00	2.296
$r_0(\text{Ca}^+ \dots \text{C}_2\text{H}_2)$ [Å]	2.80(2)	2.66(2)



$\text{C}_2\text{H}_2 \cdot \text{Ca}^+$  was produced in a pulsed nozzle/molecular beam source by laser vaporization of a calcium rod in an expansion of helium seeded with 5% acetylene. The ion was mass-selected in a reflectron time-of-flight mass spectrometer and excited with a tunable dye laser. Vibrational structure is observed and, after extrapolation, leads to a dissociation limit giving a dissociation energy  $D_0 = 18.6 \pm 5.0 \text{ kcal mol}^{-1}$ . The 0-0 band shows a partially resolved rotational structure consistent with a structure with  $\pi$ -bonding of the  $\text{Ca}^+$  ion to the acetylene molecule. The distance between the two moieties is given in the table.

France, M.R., Pullins, S.H., Duncan, M.A.: J. Chem. Phys. **108** (1998) 7049.