
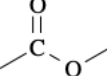

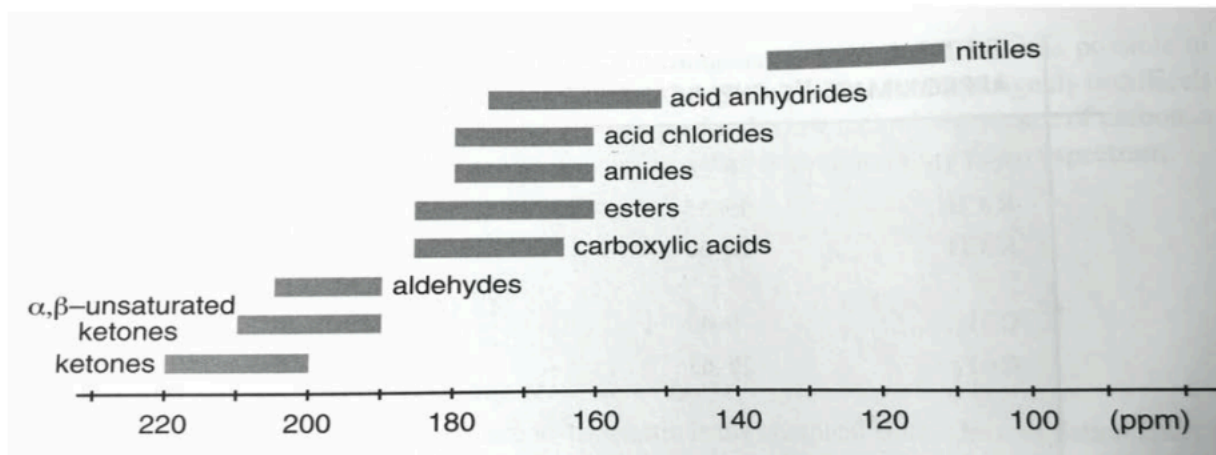


## Appendix B

### CHEMICAL SHIFTS FOR $^{13}\text{C}$ NMR

Singly bonded C < 100 ppm		Multiply bonded C Mostly > 100 ppm	
ppm		ppm	
$\text{—CH}_3$	0-30	$\text{—C}\equiv\text{C—}$	65-150
$\text{CH}_2$	10-50	$\text{C}=\text{C}$	80-145
$\text{CH}$	25-60	$\text{—C}\equiv\text{N}$	110-135
$\text{C—X}$	0-75		110-170
$\text{C—O}$	40-85		155-185
			185-220



From: Pavia, D. L., Lampman, G. M., Kriz, G. S., & Vyvyan, J. A. (2008). Introduction to Spectroscopy. Cengage Learning. p. 180.