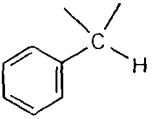
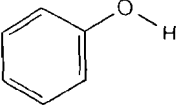
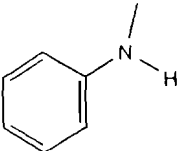
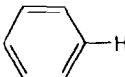


Table 13.1 Approximate Values of Chemical Shifts for $^1\text{H NMR}^a$

Type of proton	Approximate chemical shift (ppm)	Type of proton	Approximate chemical shift (ppm)
$-\text{CH}_3$	0.85	$\text{I}-\overset{\text{I}}{\underset{\text{I}}{\text{C}}}-\text{H}$	2.5-4
$-\text{CH}_2-$	1.20	$\text{Br}-\overset{\text{Br}}{\underset{\text{Br}}{\text{C}}}-\text{H}$	2.5-4
$-\overset{\text{I}}{\underset{\text{I}}{\text{C}}}-\text{H}$	1.55	$\text{Cl}-\overset{\text{Cl}}{\underset{\text{Cl}}{\text{C}}}-\text{H}$	3-4
$-\overset{\text{I}}{\text{C}}=\overset{\text{I}}{\text{C}}-\text{CH}_3$	1.7		
$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}$	2.0-2.5	$\text{R}-\text{O}-\text{H}$	1.5-4.0
	2.2-2.6		4-8
$\text{R}-\text{O}-\overset{\text{I}}{\underset{\text{I}}{\text{C}}}-\text{H}$	3.2-4.0	$\text{R}-\overset{\text{H}}{\underset{\text{H}}{\text{N}}}$	1.0-4.0
$\overset{\text{I}}{\text{C}}=\overset{\text{I}}{\text{C}}-\text{H}$	4.5-6.0		3.5-6.5
	6.5-8.0	$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$	9.0-10.0
		$\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$	10-13