

GCE Chemistry Data Sheet

Table 1

Infrared absorption data

Bond	Wavenumber /cm ⁻¹
N—H (amines)	3300 – 3500
O—H (alcohols)	3230 – 3550
C—H	2850 – 3300
O—H (acids)	2500 – 3000
C≡N	2220 – 2260
C=O	1680 – 1750
C=C	1620 – 1680
C—O	1000 – 1300
C—C	750 – 1100

Table 2

¹H n.m.r. chemical shift data

Type of proton	δ/ppm
ROH	0.5–5.0
RCH ₃	0.7–1.2
RNH ₂	1.0–4.5
R ₂ CH ₂	1.2–1.4
R ₃ CH	1.4–1.6
$\text{R}-\text{C}-\text{C}-\text{H}$ $\parallel$ O	2.1–2.6
$\text{R}-\text{O}-\text{C}-\text{H}$	3.1–3.9
RCH ₂ Cl or Br	3.1–4.2
$\text{R}-\text{C}-\text{O}-\text{C}-\text{H}$ $\parallel$ O	3.7–4.1
$\text{R}-\text{C}=\text{C}-\text{H}$ $\parallel$ H	4.5–6.0
$\text{R}-\text{C}=\text{C}-\text{H}$ $\parallel$ O	9.0–10.0
$\text{R}-\text{C}-\text{O}-\text{H}$ $\parallel$ O	10.0–12.0

Table 3

¹³C n.m.r. chemical shift data

Type of carbon	δ/ppm
$\begin{array}{c} \\ -\text{C}- \\ \end{array}$	5–40
$\text{R}-\text{C}-\text{Cl or Br}$ $ $	10–70
$\text{R}-\text{C}-\text{C}-$ $\parallel$ O	20–50
$\text{R}-\text{C}-\text{N}-$ $ $	25–60
$\begin{array}{c} \\ -\text{C}-\text{O}- \\ \end{array}$	alcohols, ethers or esters 50–90
$\text{C}=\text{C}$	90–150
$\text{R}-\text{C}\equiv\text{N}$	110–125
	110–160
$\text{R}-\text{C}-\text{O}-\text{C}-$ $\parallel$ O	esters or acids 160–185
$\text{R}-\text{C}-\text{O}-\text{C}-$ $\parallel$ O	aldehydes or ketones 190–220

AQA

