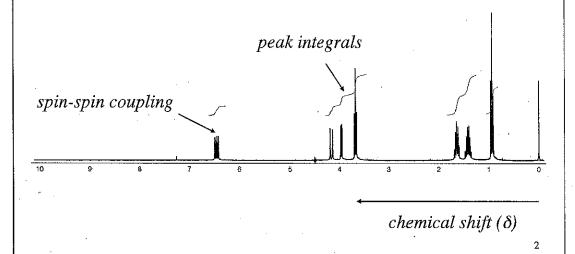
Proton (¹H) Nuclear Magnetic Resonance (NMR) Spectroscopy



NMR Spectroscopy

Chemistry 20

Spring 2015

E.M. Purcell, Nobel Prize 1952

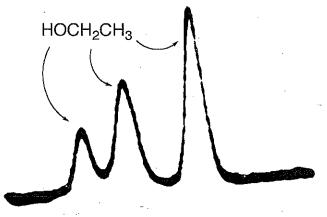


Fig. 6. The proton resonance in ethyl alcohol, observed with high resolution. The three lines arise from the CH, hydrogens, from the CH, hydrogens, and from the OH hydrogen, respectively.

low field downfield

 $\mathbf{B}_0$ 

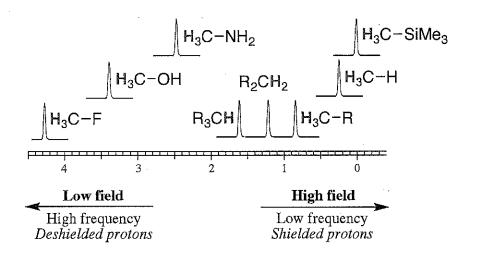
high field upfield NMR Spectroscopy

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4

· Chemical shift - electronegativity



Chemistry 20 Spring 2015 NMR Spectroscopy General chemical shift guidelines: OH, NH, SH (variable) alkynyl  $CO_2H$ benzylic, allylic (broad) α to carbonyl ~ δ 12 alkenyl CH a to nitrogen aldehyde aromatic CH next to sp<sup>3</sup> alkyl CH CH CHOH, OR, X downfield (low field) upfield (high field)

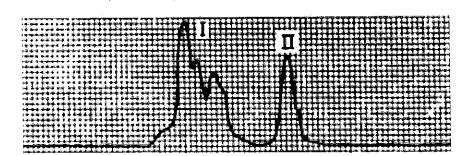
NMR Spectroscopy

Chemistry 20

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The sample was furnished through the courtesy of Professor E. J. Corey, Chemistry Department, University of Illinois.

INCREASING MAGNETIC FIELD



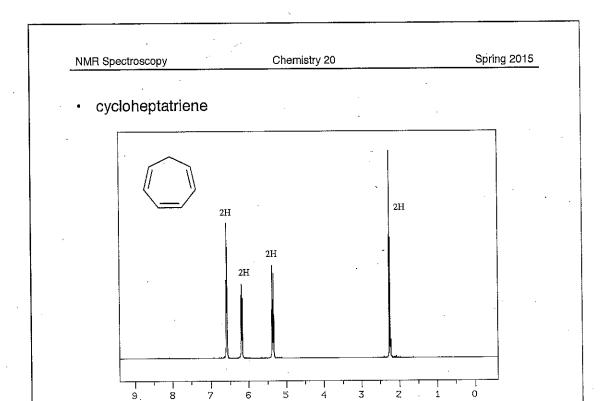


or



6

7



ррт

HSP-49-492

