IR and Secondary Structure

Vibration	$\partial\underset{\sim}{\mu}/\partial R$		Hydrogen-bonded forms: α Helix: Frequency (cm^{-1})	Hydrogen-bonded forms: α Helix: Dichroism	Hydrogen-bonded forms: β Sheet: Frequency (cm^{-1})	Hydrogen-bonded forms: β Sheet: Dichroism	Non-hydrogen-bonded: Frequency (cm^{-1})
N—H stretch	←N—H→	↔	3,290–3,300	∥	3,280–3,300	⊥	~3,400
Amide I (C═O stretch)	←C═O→	↔	1,650–1,660	∥	1,630	⊥	1,680–1,700
Amide II	↑ H | ←C—N→ ↓	↙↗	1,540–1,550	⊥	1,520–1,525	∥	<1,520?

SOURCE: Adapted from J. A. Schellman and C. Schellman, in *The Proteins*, 2d ed., vol. 2, ed. H. Neurath (New York: Academic Press, 1962), p. 1.

Example IR Spectrum - Helix

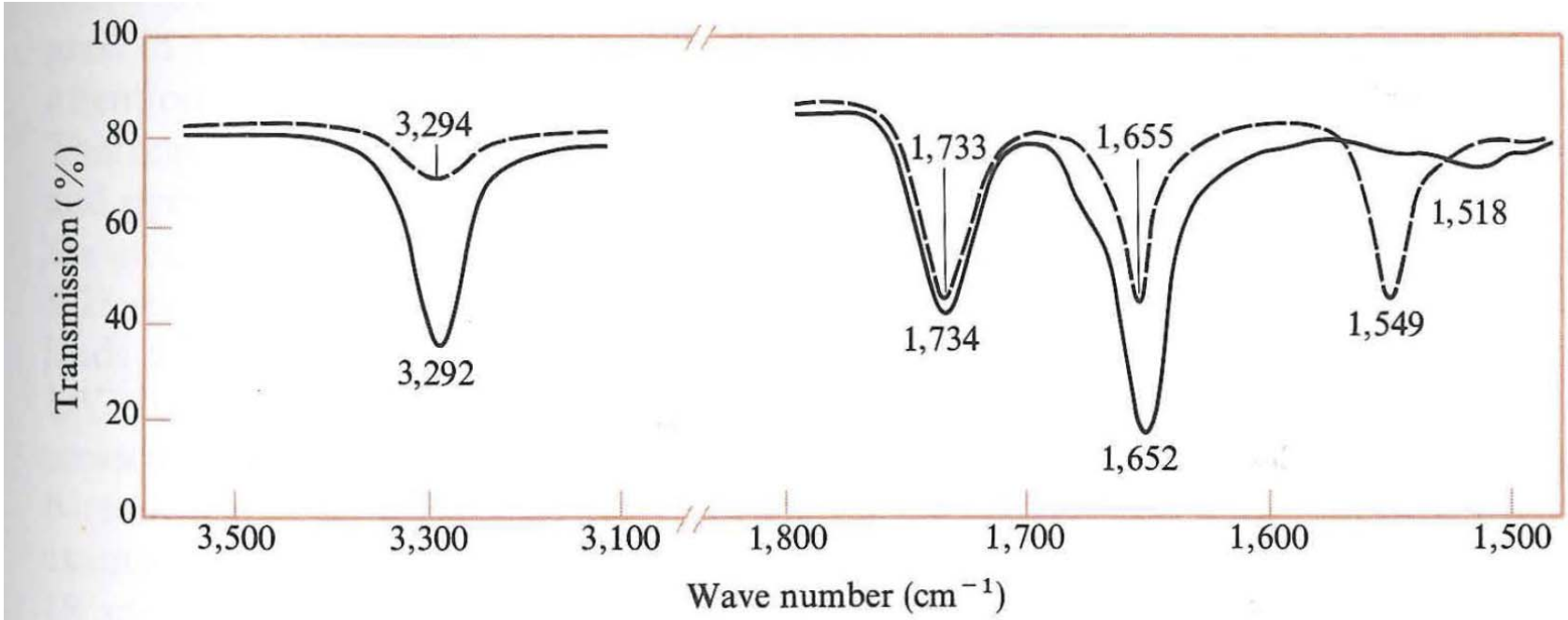

Figure 8-26

Infrared dichroism of oriented films of poly-γ-benzyl-L-glutamic acid. Light was polarized parallel (*solid line*) and perpendicular (*dashed line*) to the fiber axis. [After M. Tsuboi, *J. Poly. Sci.* 59:139 (1962).]

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