## **Isoelectric Points** University | San Diego University øSan Dieg If the side group is not ionizable, then the pl is the average of the C and N groups pKa 0 Calculations of pl for a compound with more than two dissociable groups carries more possibility for error Each amino acid is called a residue First write out all possible ionic structures for a compound in order that they occur starting with the most basic to the most acidic Addition of acid or base hydrolyzes the peptide Next, identify the isoionic, zwiterionic or neutral representation bond and adds water back across the peptide The pl is the pH at the midpoint between the pK values on bond. either side of the isoionic species What about peptides or proteins? The amino (N) terminal is written on the left and





the carboxyl (C) terminal is on the right.







































Oxidizing agents – alter sulfur links and increases strengths of gluten

- Flowing oxygen gas through the flour "ages" it by allowing sulfur-sulfur links to form – giving more cross-links (stronger flour)
- Chlorine gas and brominates (can do same thing) but no longer approved
- Ascorbic acid (vitamin C) is now used instead of gasses.
- · Also causes the flour to whiten (bleaching)



## Proteins: Threedimensional structure

Background on protein composition: Two general classes of proteins

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- <u>Fibrous</u> long rod-shaped, insoluble proteins. These proteins are strong (high tensile strength). Examples: keratin, hair, collagen, skin nails etc...
- (high tensile strength). Examples: Keratin, har, collagen, skin nalls etc...
  Globular compact spherical shaped proteins usually water-soluble. Most hydrophobic amino acids found in the interior away from the water. Nearly all enzymes are globular... an example is hemoglobin

Proteins can be simple - no added groups or modifications, just amino acids

Or proteins can be conjugated. Additional groups covalently bound to the amino acids. The naked protein is called the apoprotein and the added group is the prosthetic group. Together the protein and prosthetic group is called the holoprotein. Ex. Hemoglobin



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	Type of Structure	: Defines:	Type of Bonds:
	Primary (1°)	Order of amino acids	Covalent bonds
	Secondary (2°)	Local structure (α-helix, β-sheet, loop)	Non-covalent interactions, disulfides
	Tertiary (3°)	Overall fold, 2° elements organize and compact—low surface to volume ratio	Non-covalent interactions, disulfides
	Quaternary (4°)	Subunit organization, dimers, macro- molecular assembly	Non-covalent interactions, disulfides

















