

**151-Tutorial Assignment #4 (Fall 2009)**  
**Iron Usage and Storage in the Body: Ferritin**

Name \_\_\_\_\_  
Last first

Chem ID \_\_\_\_\_

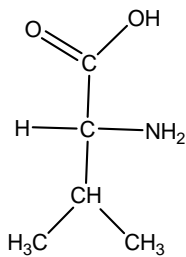
Name of TA \_\_\_\_\_

Submit the document to the Green locker in the hallway of the 3<sup>rd</sup> floor in Laboratory Science Building before 5 pm 11/2/09 (Monday).

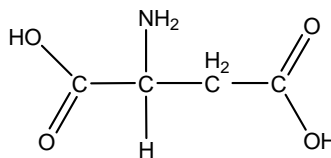
(8)1. Circle all the correct statement(s) of the following:

- a. Hemochromatosis is an iron-deficiency disorder.
- b. Ferritin is a protein.
- c. A ferritin molecule contains approximately 4416 amino acid residues.
- d. Glutamate is a protein with polar side chain.
- e. The molar mass of ferritin is 879.7 g/mole.
- f. The iron is stored in ferritin in the form of a crystalline solid similar to ferrihydrite.
- g. The oxidation numbers of Fe in the iron core are +2 and +3.
- h. All the Fe in the iron core in ferritin is coordinated to five O(II) ions and one phosphate group.
- i. The 3-fold channels in ferritin are lined with polar amino acid residues.

(4)2. Two amino acids, valine and aspartic acid form a peptide bond to make a dipeptide Draw the structure of the dipeptide and circle the peptide bond.



valine



aspartic acid

(8) 3. Given that iron comprises 0.0080% of the body's mass.

- a) Calculate the number of iron atoms in a person of 55.0 kg body mass. Show your work in the space below and enter your answer with correct number of significant figures in the box.

**moles**

- b) If all the iron are coming from the ferrihydrite stored in ferritin, how many grams of ferrihydrite can provide the amount of iron calculated in a)? Show your work in the space below and enter your answer with correct number of significant figures in the box.

**grams**