What is the isoelectric point, pI, of glutamate? Given p*K*a1 = 2.2, p*K*a2 = 4.3 and p*K*a3 = 9.7.

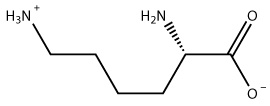
|  |  |  |
| --- | --- | --- |
|  |  | 4.30 |
|  |  | 5.95 |
|  |  | 3.25 |
|  |  | 7.00 |

Which amino acid is classified as polar but uncharged?

|  |  |  |
| --- | --- | --- |
|  |  | methionine |
|  |  | phenylalanine |
|  |  | threonine |
|  |  | lysine |

Which pairs of amino acid side chains might you expect to find in a salt bridge in a protein at pH 7.0?

|  |  |  |
| --- | --- | --- |
|  |  | Histidine and Lysine |
|  |  | Aspartate and Histidine |
|  |  | Aspartate and Arginine |
|  |  | Serine and Glutamate |
|  |  | Arginine and Phenylalanine |



The amino acid shown is:

|  |  |  |
| --- | --- | --- |
|  |  | Lysine |
|  |  | Phenylalanine |
|  |  | Methionine |
|  |  | Leucine |

What is the pH of a glycine solution in which the α-carboxyl group is one-third dissociated? Given p*K*a1= 2.3, p*K*a2 = 9.6.

|  |  |  |
| --- | --- | --- |
|  |  | 2.00 |
|  |  | 9.30 |
|  |  | 5.95 |
|  |  | 1.70 |

Peptide bond formation is:

|  |  |  |
| --- | --- | --- |
|  |  | a dehydration reaction |
|  |  | a head-to-head polymerization of amino acids |
|  |  | energetically favorable |
|  |  | formation of a C-C bond |

Which amino acid is classified as non-polar or hydrophobic?

|  |  |  |
| --- | --- | --- |
|  |  | arginine |
|  |  | alanine |
|  |  | aspartate |
|  |  | asparagine |

How do disulfide bonds (-S-S-) form in proteins?

|  |  |  |
| --- | --- | --- |
|  |  | reaction between the side chains of two Met residues. |
|  |  | reaction between the side chains of two Cys residues. |
|  |  | reaction between the side chain of one Met residue and one Cys residue. |
|  |  | none of the above. |

Which form of glycine (p*K*a1= 2.3, p*K*a2 = 9.6) predominates at physiological pH?

|  |  |  |
| --- | --- | --- |
|  |  | H3N+CH2CO2H |
|  |  | H3N+CH2CO2- |
|  |  | H2NCH2CO2H |
|  |  | H2NCH2CO2- |

Which amino acids absorb light at 250-280 nm?

|  |  |  |
| --- | --- | --- |
|  |  | arginine, lysine and histidine |
|  |  | phenylalanine, tyrosine and tryptophan |
|  |  | leucine, isoleucine and valine |
|  |  | methionine, cysteine and proline |

The p*K*a of the side chain of histidine is 6.0. At pH 7.0 what is the ratio of positively charged histidine side chains to neutral side chains?

|  |  |  |
| --- | --- | --- |
|  |  | 1:1 |
|  |  | 1:2 |
|  |  | 1:10 |
|  |  | 10:1 |
|  |  | 2:1 |

Which two groups of an amino acid react to form a peptide bond?

|  |  |  |
| --- | --- | --- |
|  |  | the alpha amino group and the alpha carboxyl group |
|  |  | the alpha amino group and the side chain carboxyl group |
|  |  | the alpha carboxyl group and the side chain amine |
|  |  | the side chain amine and the side chain carboxyl group |

At pH 7.0 which of the following amino acid side chains would you expect to have a protonated side chain

|  |  |  |
| --- | --- | --- |
|  |  | Glutamate |
|  |  | Arginine |
|  |  | Leucine |
|  |  | Histidine |
|  |  | Tryptophan |

Which amino acid is classified as basic?

|  |  |  |
| --- | --- | --- |
|  |  | proline |
|  |  | glutamine |
|  |  | lysine |
|  |  | cysteine |