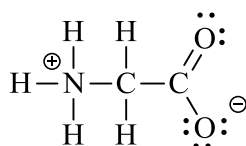
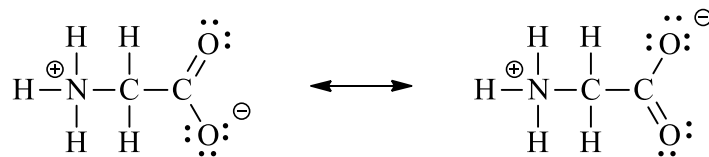


- Glycine, $\text{NH}_2\text{CH}_2\text{COOH}$, the simplest of all naturally occurring amino acids, has a melting point of $292\text{ }^\circ\text{C}$. The $\text{p}K_a$ of the acid group is 2.35 and the $\text{p}K_a$ associated with the amino group is 9.78. Draw a Lewis structure that indicates the charges on the molecule at the physiological pH of 7.4.



Use your structure to illustrate the concept of resonance.



Describe the hybridisation of the two carbon atoms and the nitrogen atom in glycine and the molecular geometry of the atoms surrounding these three atoms.

N: sp^3 hybridised; tetrahedral geometry

CH_2 : sp^3 hybridised; tetrahedral geometry

CO_2^- : sp^2 hybridised; trigonal planar geometry

Glycine has an unusually high melting point for a small molecule. Suggest a reason for this.

In its zwitterionic state, glycine has very strong electrostatic attractions (*i.e.* ionic bonds) between the NH_3^+ and CO_2^- groups giving it very high melting point.

Do you expect glycine to be water soluble? Give a reason for your answer.

Yes. It is ionic so dissolves in the very polar solvent water.