

Answer on Question #63366 - Chemistry – General Chemistry

In the mid-1930s a substance was isolated from a fungus that is a parasite of ryes and other grasses. This alkaloid, lysergic acid, has been of great interest to chemists because of its strange, dramatic action on the human mind. Many derivatives of lysergic acid are known, some with medicinal applications. Perhaps the best known derivative of lysergic acid is the potent hallucinogen lysergic acid diethylamide (LSD)

Like other alkaloids, LSD is a weak base, with $K_b = 7.6 \times 10^{-7}$. What is the pH of a 0.21 M solution of LSD?

Solution.

$$K_{b,B} = 10^{-7}-10^{-4}; C_B > 10^{-6} \text{ M}$$

$$pH = 14 - \frac{1}{2} pK_{b,B} + \frac{1}{2} \lg C_B$$

$$pH = 14 + 1/2 \times \lg(7.6 \times 10^{-7}) + 1/2 \times \lg(0.21) = 14 + 1/2 \times (-6.12) + 1/2 \times (-0.68) = 10.6$$

Answer: pH = 10.6