Calculating pH of Base Solutions – Reading Guide

*section 14.3 in OpenStax*

**Strong Bases**

List and memorize the six **strong bases** shown in Figure 14.6:

Write a balanced chemical equation for the dissociation of calcium hydroxide:

Calculate the pH of a 0.122 *M* solution of calcium hydroxide. *Pay attention to the stoichiometry shown in your balanced equation above.*

*(ans. pH = 13.4)*

**Weak Bases**

Complete the following equations, showing how each base produces OH–. *Include charges*.

B + H2O →

NH3 + H2O →

CH3CH2NH2 + H2O →

Write the Kb equation for ethylamine, CH3CH2NH2, using your balanced reaction above.

For weak bases, an ICE table must be used to determine the equilibrium concentration of H3O+. Follow Example 14.13 to see how this is done. Create an ICE table for a 0.150 *M* solution of ethylamine.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | CH3CH2NH2 (*aq)* + H2O (*l*) | | ⮀ | + | |
| I |  | -- |  |  |  |
| C |  | -- |  |  |  |
| E |  | -- |  |  |  |

Calculate the pOH and the pH of a 0.150 *M* solution of ethylamine. The Kb value is 5.6 x 10-4.

*Note: You may use the “x is small approximation”, but you should check your assumption.*

*(ans. [OH–] = 0.00917 M, pOH=2.04, pH=11.9)*

**End of Chapter 14 Practice Problems**

#19b–d, 57a, 69d, 77

For detailed solutions to these problems, go to the [OpenStax website](https://openstaxcollege.org/textbooks/chemistry/resources) and download the “Student Answer and Solution Guide.”