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Finally I get this ebook, thanks for all these I can get now!

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Cool! I'am really happy

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My friends are so mad that they do not know how I have all the high quality ebook which they do not!

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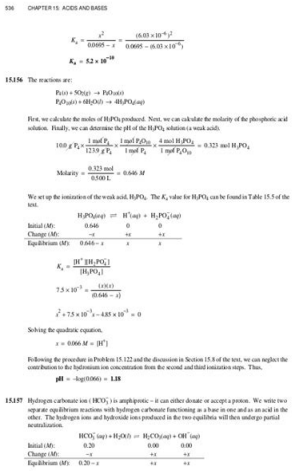
so many fake sites. this is the first one which worked! Many thanks



536 CHAPTER 15: ACIDS AND BASES

$$K_a = \frac{x^2}{0.0085 - x} = \frac{(6.03 \times 10^{-4})^2}{0.0085 - (6.03 \times 10^{-4})}$$

$$K_a = 5.2 \times 10^{-10}$$

15.156 The reactions are:

$$P_4(s) + 5O_2(g) \rightarrow P_4O_{10}(s)$$
$$P_4O_{10}(s) + 6H_2O(l) \rightarrow 4H_3PO_4(aq)$$

First, we calculate the moles of H_3PO_4 produced. Next, we can calculate the molarity of the phosphoric acid solution. Finally, we can determine the pH of the H_3PO_4 solution (a weak acid).

$$10.0 \text{ g } P_4 \times \frac{1 \text{ mol } P_4}{123.9 \text{ g } P_4} \times \frac{1 \text{ mol } P_4O_{10}}{1 \text{ mol } P_4} \times \frac{4 \text{ mol } H_3PO_4}{1 \text{ mol } P_4O_{10}} = 0.323 \text{ mol } H_3PO_4$$

$$\text{Molarity} = \frac{0.323 \text{ mol}}{0.500 \text{ L}} = 0.646 \, M$$

We set up the ionization of the weak acid, H_3PO_4. The K_a value for H_3PO_4 can be found in Table 15.5 of the text.

	$H_3PO_4(aq)$	$\rightleftharpoons$	$H^+(aq)$	+	$H_2PO_4^-(aq)$
Initial (M):	0.646		0		0
Change (M):	$-x$		$+x$		$+x$
Equilibrium (M):	$0.646 - x$		x		x

$$K_a = \frac{[H^+][H_2PO_4^-]}{[H_3PO_4]}$$

$$7.5 \times 10^{-3} = \frac{(x)(x)}{(0.646 - x)}$$

$$x^2 + 7.5 \times 10^{-3}x - 4.85 \times 10^{-3} = 0$$

Solving the quadratic equation,

$$x = 0.066 \, M = [H^+]$$

Following the procedure in Problem 15.122 and the discussion in Section 15.8 of the text, we can neglect the contribution to the hydronium ion concentration from the second and third ionization steps. Thus,

$$\text{pH} = -\log(0.066) = \mathbf{1.18}$$

15.157 Hydrogen carbonate ion (HCO_3^-) is amphiprotic – it can either donate or accept a proton. We write two separate equilibrium reactions with hydrogen carbonate functioning as a base in one and as an acid in the other. The hydrogen ions and hydroxide ions produced in the two equilibria will then undergo partial neutralization.

	$HCO_3^-(aq) + H_2O(l)$	$\rightleftharpoons$	$H_2CO_3(aq) + OH^-(aq)$
Initial (M):	0.20		0.00 0.00
Change (M):	$-x$		$+x$ $+x$
Equilibrium (M):	$0.20 - x$		$+x$ $+x$