

ANSWER KEY	Chapter 6 Test Answer Key	BLM 6.4.1A
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Answers to Multiple-Choice Questions

1. c
2. d
3. b
4. b
5. c
6. a
7. a
8. d
9. b
10. c
11. d
12. b
13. c
14. a
15. b

Answers to Numerical Response Questions

16.	1.5×10^{-2} g
17.	0.455
18.	2.9×10^{-9} mol/L
19.	0.398
20.	A: pH = 0.698; B: pH = 1.700
21.	0.0010 mol/L
22.	0.0040 mol/L
23.	1.48 mg
24.	10.88
25.	6.95×10^{-6} mol/L

Answers to Written Response Questions

26. Phosphoric acid, H_3PO_4 , ionizes in three steps.

1. $\text{H}_3\text{PO}_4(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{PO}_4^-(\text{aq}) + \text{H}_3\text{O}^+(\text{aq})$
2. $\text{H}_2\text{PO}_4^-(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{HPO}_4^{2-}(\text{aq}) + \text{H}_3\text{O}^+(\text{aq})$
3. $\text{HPO}_4^{2-}(\text{aq}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{PO}_4^{3-}(\text{aq}) + \text{H}_3\text{O}^+(\text{aq})$

In each step, only some of the acid ionizes because all are weak acids. The $\text{H}_3\text{O}^+(\text{aq})$ concentration will never be three times the concentration of the $\text{H}_3\text{PO}_4(\text{aq})$.

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27. If the acid was 100% ionized, the pH would be 0.854. The pH of the solution is higher (2.418). Therefore, the concentration of $\text{H}_3\text{O}^+(\text{aq})$ is less than the concentration of the acid. Not all of the acid ionized. The acid must be a weak acid.