Chapter 9 Practice Problem Key

**9.39** A Brønsted–Lowry base must contain a lone pair of electrons, but it may be neutral or have a net negative charge. Use Example 9.2 to help determine which of the compounds are Brønsted–Lowry bases.

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| --- | --- |
| a. OH–: lone pairs on OH,  a Brønsted–Lowry base | d. PO43–: lone pairs on O,  a Brønsted–Lowry base |
| b. Ca2+: no lone pair of electrons | e. OCl–: lone pairs on O and Cl,  a Brønsted–Lowry base |
| c. C2H6: no lone pair of electrons | f. MgCO3: lone pairs on O,  a Brønsted–Lowry base |

**9.51** Draw the acid–base reaction.



**9.61** a. An acid that dissociates to a greater extent in water is a stronger acid: **A is the stronger acid.**

b. An acid with a smaller *K*a is weaker (**A** is weaker): **B is the stronger acid.**

c. An acid with a stronger conjugate base is a weaker acid (**A** is weaker): **B is the stronger acid.**

**9.65** The stronger acid has more dissociated ions. The stronger acid has the larger *K*a.

a. **B** has more dissociated ions (A– and H3O+) and is therefore the stronger acid.

b. **B** has the larger *K*a since it is the stronger acid.

**9.71** Use the equation [H3O+] = *K*w/[OH–] to calculate the hydronium ion concentration as in Sample Problem 9.11.









**9.83** Use a calculator to determine the logarithm of a number that contains a coefficient other than one in scientific notation; pH = –log [H3O+].

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**9.89** Write the balanced equation.



**9.97** Calculate the number of milliliters of solution needed.



**9.103** Yes, a buffer can be prepared from equal amounts of NaCN and HCN. HCN is a weak acid and CN– is its conjugate base, so in equal amounts they form a buffer.

**9.115** By breathing into a bag, the individual breathes in air with a higher CO2 concentration. Thus, the CO2 concentration in the lungs and the blood increases, thereby lowering the pH.