

Write balanced net ionic equations for the reactions that occur in questions 1-20.

- 1) Equal volumes of 0.2 *M* hydrobromic acid and 0.2 *M* lithium hydroxide are mixed.
- 2) Equal volumes of 0.25 *M* acetic acid and 0.25 *M* potassium hydroxide are combined.
- 3) Equal volumes of 0.15 *M* sulfurous acid and 0.30 *M* potassium hydroxide are mixed.
- 4) Equal volumes of 0.15 *M* sulfurous acid and 0.15 *M* lithium hydroxide are mixed.
- 5) Aqueous solutions of sodium acetate and hydrochloric acid are combined.
- 6) A 0.2 *M* solution of ammonia is mixed with a 0.2 *M* solution of nitric acid.
- 7) Equal volumes of 0.2 *M* sodium sulfite and 0.4 *M* hydroiodic acid are mixed.
- 8) Equal volumes of 0.1 *M* sodium carbonate and 0.1 *M* sulfuric acid are combined.
- 9) Solutions of ammonium nitrate and sodium cyanide are poured into a beaker.
- 10) Equal volumes of 0.2 *M* sodium carbonate and 0.4 *M* hydrochloric acid are combined.
- 11) Solutions of acetic acid and sodium fluoride are poured into a beaker.
- 12) Dinitrogen pentoxide gas is bubbled through water.
- 13) Carbon dioxide gas is bubbled through a solution of 0.5 *M* potassium hydroxide.
- 14) Hydrogen bromide gas is mixed with ammonia gas.
- 15) Hydrogen chloride gas is mixed with ammonia gas.
- 16) Boron trifluoride gas is mixed with gaseous ammonia.
- 17) Solid ammonium nitrate is added to water.
- 18) Solid potassium fluoride is added to water.

- 19) Solid sodium oxide is placed in water.
- 20) Solid sodium acetate is stirred into a beaker of distilled water.
- 21) 150 mL of 0.50 *M* NaOH is added to a 200 mL solution of 2.0 *M* HF.
- How many moles of OH⁻ are in solution?
 - How many mole of F⁻ remain in the final solution?
- 22) An odor is detected when solutions of ammonium fluoride and potassium hydroxide are combined. What is the odor?