

## 16

## INTERPRETING GRAPHICS

Use with Section 16.1

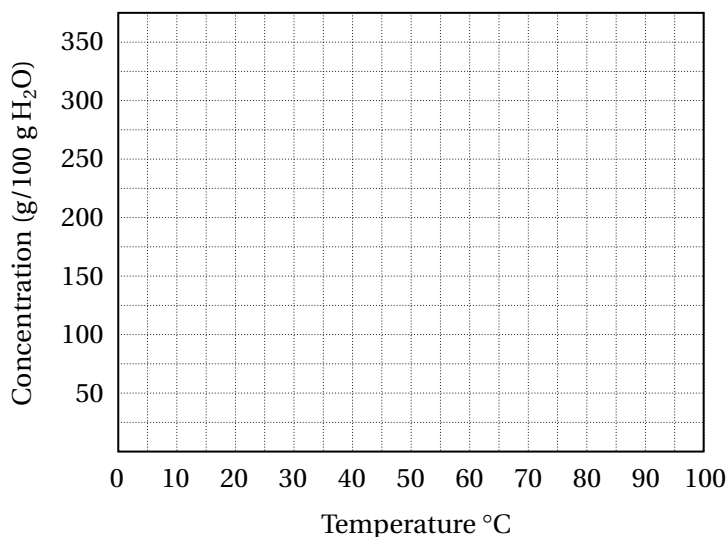
| Solubilities of Some Substances in Water at Various Temperatures |                                                 |                                          |         |         |       |
|------------------------------------------------------------------|-------------------------------------------------|------------------------------------------|---------|---------|-------|
|                                                                  |                                                 | Solubility (g/100 g of H <sub>2</sub> O) |         |         |       |
| Substance                                                        | Formula                                         | 0°C                                      | 20°C    | 50°C    | 100°C |
| Barium hydroxide                                                 | Ba(OH) <sub>2</sub>                             | 1.67                                     | 31.89   | —       | —     |
| Barium sulfate                                                   | BaSO <sub>4</sub>                               | 0.00019                                  | 0.00025 | 0.00034 | —     |
| Calcium hydroxide                                                | Ca(OH) <sub>2</sub>                             | 0.189                                    | 0.173   | —       | 0.07  |
| Lead(II) chloride                                                | PbCl <sub>2</sub>                               | 0.60                                     | 0.99    | 1.70    | —     |
| Lithium carbonate                                                | Li <sub>2</sub> CO <sub>3</sub>                 | 1.5                                      | 1.3     | 1.1     | 0.70  |
| Potassium chlorate                                               | KClO <sub>3</sub>                               | 4.0                                      | 7.4     | 19.3    | 56.0  |
| Potassium chloride                                               | KCl                                             | 27.6                                     | 34.0    | 42.6    | 57.6  |
| Sodium chloride                                                  | NaCl                                            | 35.7                                     | 36.0    | 37.0    | 39.2  |
| Sodium nitrate                                                   | NaNO <sub>3</sub>                               | 74                                       | 88.0    | 114.0   | 182   |
| Sodium sulfate                                                   | Na <sub>2</sub> SO <sub>4</sub>                 | 4.76                                     | 62      | 50.0    | 41.0  |
| Silver nitrate                                                   | AgNO <sub>3</sub>                               | 122                                      | 222.0   | 455.0   | 733   |
| Lithium bromide                                                  | LiBr                                            | 143.0                                    | 166     | 203     | 266.0 |
| Cane sugar (sucrose)                                             | C <sub>12</sub> H <sub>22</sub> O <sub>11</sub> | 179                                      | 230.9   | 260.4   | 487   |

A portion of Table 16.1 from your textbook has been reproduced above. Use the table to answer the following questions.

- Saturated solutions of each of the following compounds are made at 20°C. Circle the letter(s) of the solution(s) that will form a precipitate upon heating.
  - NaCl
  - Na<sub>2</sub>SO<sub>4</sub>
  - Li<sub>2</sub>CO<sub>3</sub>
  - sucrose
- A saturated solution of potassium chloride is prepared in 100.0 g of water at 20°C. If the solution is heated to 50°C, how much more KCl must be added to obtain a saturated solution?

3. A saturated solution of sucrose in 1000.0 g of boiling water is cooled to 20°C. What mass of rock candy will be formed?

4. Using data from the table, plot the solubility curves of KCl, LiBr and Na<sub>2</sub>SO<sub>4</sub> on the graph below. Be sure to label each curve. Use the graph to answer the following questions.



- a. Which of the compounds is most soluble at 25°C?

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- b. Which of the compounds has the lowest solubility at 90°C?

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