[4.3] Dilutions

100 M → 10 M → 1 M → 0.1 M → 0.01 M
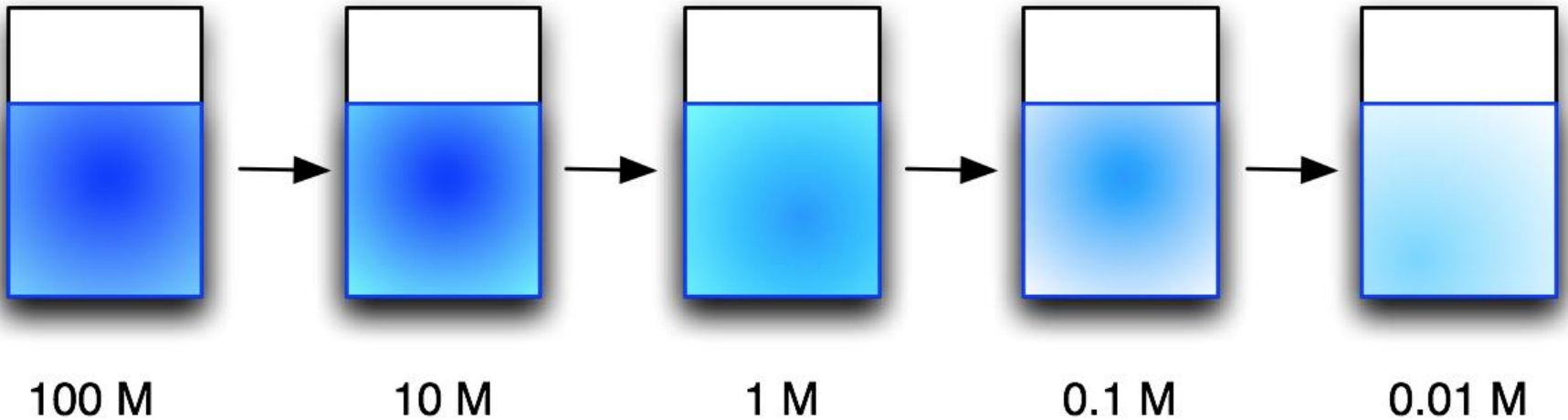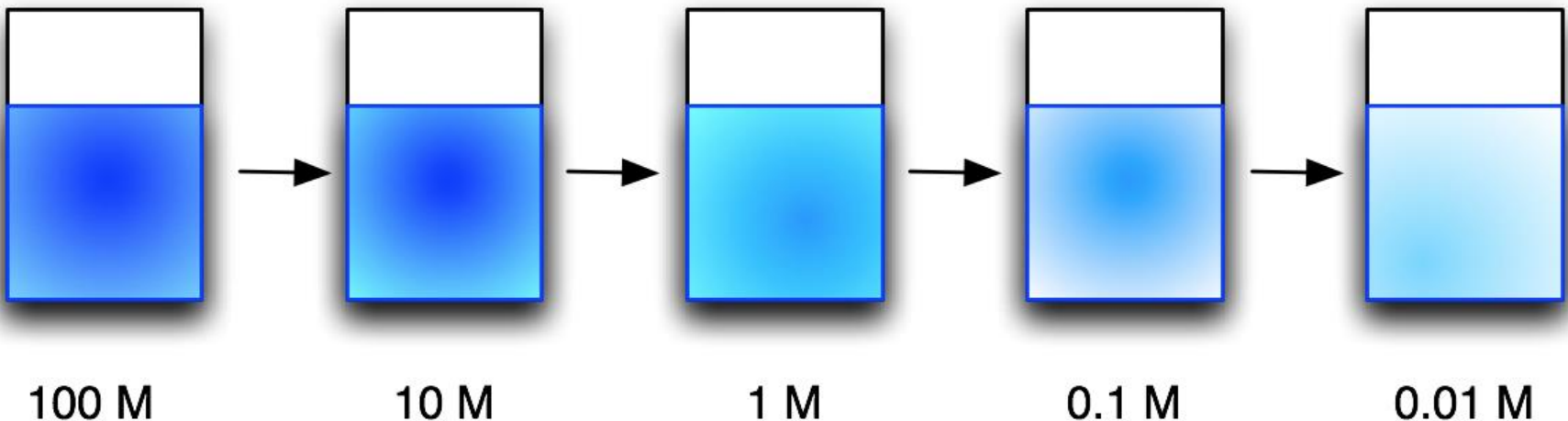
Dilutions

- **Dilution** (稀释) is the process of reducing the concentration of a solute in solution, usually simply by mixing with more solvent

| 100 M | 10 M | 1 M | 0.1 M | 0.01 M |

How to Calculate

Solve using this equation:

$$M_1V_1 = M_2V_2$$

Molarity of concentrated

Volume of solution concentrated solution

Molarity of diluted

Volume of diluted solution

Practice Problem 1

If 65.5 mL of HCl stock solution is used to make 450.0 mL of a 0.675 M HCl dilution, what is the molarity of the stock solution?

Practice Problem 1

If 65.5 mL of HCl stock solution is used to make 450.0 mL of a 0.675 M HCl dilution, what is the molarity of the stock solution?

1. $M_1 V_1 = M_2 V_2$

2. $(0.675 \text{ M})(450.0 \text{ mL}) = M_2 (65.5 \text{ mL})$

3. $4.64 \text{ M} = M_2$

Practice Problem 2

How do you prepare a 250.0 mL of a 2.35 M HF dilution from a 15.0 M stock solution?

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How do you prepare a 250.0 mL of a 2.35 M HF dilution from a 15.0 M stock solution?

1. $M_1V_1=M_2V_2$

2. $(2.35 \text{ M})(0.2500\text{L}) = 15.0 \text{ M}(V_2)$

3. $0.0392 \text{ L} = 39.2 \text{ mL } V_2$

4. $250.0 \text{ mL} - 39.2 \text{ mL} = 210.8 \text{ mL} = 211 \text{ mL}$ is what you need to add to solution.

Practice Problem 3

How much water do you need to add to prepare 500.0 mL of 1.77 M H_2SO_4 dilution from an 18.0 M H_2SO_4?

Practice Problem 3

How much water do you need to add to prepare 500.0 mL of 1.77 M H_2SO_4 dilution from an 18.0 M H_2SO_4?

1. $M_1V_1 = M_2V_2$
2. (1.77 M)(500.0mL) = 18.0M (V_2)
3. 49.2 mL = V_2
4. 500.0 mL – 49.2 mL = 450.8 mL = 451 mL

HOMEWORK

- **Textbook:** Hebden
- **Pg.** 212 #30-33
- **Pg.** 102 #78, 80, 86, 87, 89