

# AQUEOUS SYSTEMS

CHEMISTRY

LEVEL 3

## Study Checklist

If you've picked up this checklist, congrats! You've begun the first step in a system of resources designed to help you through the Aqueous Systems external. To make the most of this, we suggest you sit down, grab a pen, and mark any points that you're feeling a little unsure of. Then, create a subject audit using our template, or refer to the page numbers to find the section in our walkthrough guide to help you out!

### EQUILIBRIUM

- |  |   |
|--|---|
| <input type="checkbox"/> I can define the term "equilibrium" with respect to chemistry [3]   | <input type="checkbox"/> I can describe and explain how changing concentrations of products or reactants affects an equilibrium [9] |
| <input type="checkbox"/> I can generate equilibrium constant ( $K_c$ ) expressions for any given reaction [4]  | <input type="checkbox"/> I can describe and explain how a change in pressure affects an equilibrium [12]                            |
| <input type="checkbox"/> I can describe what the value of the equilibrium constant means in terms of the amounts of products and reactants in a system [6] | <input type="checkbox"/> I can describe and explain how a change in temperature affects an equilibrium [15]                         |
| <input type="checkbox"/> I can calculate $Q_c$ and explain its meaning [7]   | <input type="checkbox"/> I can describe and explain how a catalyst affects an equilibrium [18]                                      |
| <input type="checkbox"/> I can state Le Chatelier's principle [9]  |   |

### SOLUBILITY

- |   |   |
|---|---|
| <input type="checkbox"/> I can define the term solubility [19]  | <input type="checkbox"/> I can describe and explain whether precipitation will occur using $Q_s$ [23] |
| <input type="checkbox"/> I can generate solubility constant ( $K_s$ ) expressions for a given reaction [20]         | <input type="checkbox"/> I can describe and explain the common ion effect [24]                        |
| <input type="checkbox"/> I can calculate the solubility of a species given the solubility constant $K_s$ value [21] | <input type="checkbox"/>  |

### ACIDS AND BASES

- |  |   |
|--|---|
| <input type="checkbox"/> I can define the terms acid and base [26]                                   | <input type="checkbox"/> I can calculate the concentration of $H_3O^+$ ions given a pH [31] |
| <input type="checkbox"/> I can describe and explain whether an acid or a base is strong or weak [29] | <input type="checkbox"/> I can describe $K_w$ and give its value [33]                       |
| <input type="checkbox"/> I can calculate pH given a concentration of $H_3O^+$ ions [31]              | <input type="checkbox"/> I can calculate the pH of strong acids and bases [35]              |

- I can define and explain  $K_a$  and  $K_b$  [37]
- I can generate  $K_a$  and  $K_b$  expressions given a reaction [37]
- I can convert between  $pK_a$ ,  $K_a$ ,  $pK_b$  and  $K_b$  [38]
- I can calculate the pH of solutions of weak acids and bases [40]

## BUFFER SOLUTIONS

- I can describe what a buffer solution is and what is in a buffer solution [47]
- I can describe and explain the function of a buffer system [48]
- I can calculate the pH of a buffer solution [48]

## SPECIES IN SOLUTION

- I can describe and explain the relative concentrations of species in solution for:
  - Strong acids and bases [50]
  - Weak acids and bases [53]
  - Neutral salts [54]
  - Salts of weak acids and bases [54]
- I can describe and explain what makes a solution conductive [57]

## TITRATION CURVES

- I can define the term equivalence point [63]
- I can describe and explain where a buffer zone is on a titration curve [64]
- I can describe and explain the significance of the half equivalence point [66]
- I can calculate the pH of a solution at the equivalence point of a titration [67]
- I can describe why an indicator would or would not be suitable for use in a given [70]
- I can describe and explain the structure, bonding and properties of covalent network solid solids

