

## Product Information

### Basal Salt Mixtures

The use of a balanced salt solution (BSS) in tissue culture is generally attributed to early workers in the field. In 1885, Sydney Ringer developed a solution of inorganic salts designed to maintain contractility of mammalian heart tissue. A less specific salt solution was designed by Tyrode for use in work with mammalian cells in general. Tyrode's salt solution became the accepted fluid for diluting protein components of media of natural origin. Since that time, many other balanced salt solutions have been developed for use in tissue culture. The current role of a balanced salt solution in cell culture is multifaceted and can be divided into four principal functions:

- serves as an irrigating, transporting and diluting fluid while maintaining intra- and extracellular osmotic balance;
- provides cells with water and certain bulk inorganic ions essential for normal cell metabolism;
- combined with a carbohydrate, such as glucose, provides the principal energy source for cell metabolism;
- provides a buffering system to maintain the medium within the physiological pH range (7.2-7.6).

#### HANKS' BALANCED SALTS

| COMPONENT                                    | H 6136<br>H 6393<br>g/L | H 9269<br>H 2513<br>[1X]<br>g/L | H 1387<br>g/L | H 8264<br>[1X]<br>g/L | H 2387<br>g/L |
|----------------------------------------------|-------------------------|---------------------------------|---------------|-----------------------|---------------|
|                                              |                         |                                 |               |                       |               |
| <b>INORGANIC SALTS</b>                       |                         |                                 |               |                       |               |
| CaCl <sub>2</sub> •2H <sub>2</sub> O         | 0.185                   | 0.185                           | 0.185         | 0.185                 | —             |
| MgSO <sub>4</sub> (anhyd)                    | 0.09767                 | 0.09767                         | 0.09767       | 0.09767               | —             |
| KCl                                          | 0.4                     | 0.4                             | 0.4           | 0.4                   | 0.4           |
| KH <sub>2</sub> PO <sub>4</sub> (anhyd)      | 0.06                    | 0.06                            | 0.06          | 0.06                  | 0.06          |
| NaHCO <sub>3</sub>                           | —                       | 0.35                            | —             | 0.35                  | —             |
| NaCl                                         | 8.0                     | 8.0                             | 8.0           | 8.0                   | 8.0           |
| Na <sub>2</sub> HPO <sub>4</sub> (anhydrous) | 0.04788                 | 0.04788                         | 0.04788       | 0.04788               | 0.04788       |
| <b>OTHER</b>                                 |                         |                                 |               |                       |               |
| D-Glucose                                    | 1.0                     | 1.0                             | 1.0           | 1.0                   | 1.0           |
| Phenol Red•Na                                | 0.011                   | 0.011                           | —             | —                     | 0.011         |
| <b>ADD</b>                                   |                         |                                 |               |                       |               |
| NaHCO <sub>3</sub>                           | 0.35                    | —                               | 0.35          | —                     | 0.35          |
| Grams of powder required to prepare 1 L      | 9.8                     | N/A                             | 9.8           | N/A                   | 9.5           |

| COMPONENT                                    | H 9394<br>H 8389<br>[1X]<br>g/L | H 4891<br>g/L | H 1641<br>[10X]<br>g/L | H 4641<br>[10X]<br>g/L | H 6648<br>[1X]<br>g/L | H 5899<br>[1X]<br>g/L |
|----------------------------------------------|---------------------------------|---------------|------------------------|------------------------|-----------------------|-----------------------|
|                                              |                                 |               |                        |                        |                       |                       |
| <b>INORGANIC SALTS</b>                       |                                 |               |                        |                        |                       |                       |
| CaCl <sub>2</sub> •2H <sub>2</sub> O         | —                               | —             | 1.85                   | —                      | —                     | 0.1855                |
| MgSO <sub>4</sub> (anhyd)                    | —                               | —             | 0.9767                 | —                      | —                     | 0.09767               |
| KCl                                          | 0.4                             | 0.4           | 4.0                    | 4.0                    | 0.4                   | 0.4                   |
| KH <sub>2</sub> PO <sub>4</sub> (anhyd)      | 0.06                            | 0.06          | 0.6                    | 0.6                    | 0.06                  | 0.06                  |
| NaHCO <sub>3</sub>                           | 0.35                            | —             | —                      | —                      | 0.35                  | —                     |
| NaCl                                         | 8.0                             | 8.0           | 80.0                   | 80.0                   | 8.0                   | 8.0                   |
| Na <sub>2</sub> HPO <sub>4</sub> (anhydrous) | 0.04788                         | 0.04788       | 0.4788                 | 0.4788                 | 0.04788               | 0.0475                |
| <b>OTHER</b>                                 |                                 |               |                        |                        |                       |                       |
| D-Glucose                                    | 1.0                             | 1.0           | 10.0                   | 10.0                   | 1.0                   | 1.0                   |
| Phenol Red•Na                                | 0.011                           | —             | 0.11                   | 0.11                   | —                     | —                     |
| <b>ADD</b>                                   |                                 |               |                        |                        |                       |                       |
| NaHCO <sub>3</sub>                           | —                               | 0.35          | 0.35 at 1X             | 0.35 at 1X             | —                     | 0.35 at               |
| Grams of powder required to prepare 1 L      | N/A                             | 9.5           | N/A                    | N/A                    | N/A                   | N/A                   |

#### REFERENCES

- Hanks, J. (1976) Hanks' Balanced Salt Solution and pH Control. Tissue Culture Association Manual. 3, 3.

2. Hanks, J.H. and Wallace, R.E. (1949). Relation of Oxygen and Temperature in the Preservation of Tissues by Refrigeration. *Proc.Soc. Exp. Biol. Med.* 71, 196-200.