Product Name

Name: Sodium Pyruvate Solution, 11.0 mg/mL (100 mM)

Cat. No.: C3546-0100

Size: 100 mL

Product Description

Sodium Pyruvate like glutamine and glucose is considered an important constituent of most culture media and is now recognized as an easily accessible and additional carbohydrate source. Pyruvate, an anion of pyruvic acid, is the end product of glycolysis from glucose and converts into lactic acid in the absence of molecular oxygen for the purpose of obtaining more chemical energy. During glycolysis glucose is converted to pyruvate with the production of adenosine triphosphate (ATP) from ADP. In the mitochondria of aerobic organisms, pyruvate is converted to acetyl-CoA, which in turn is completely oxidized to carbon dioxide (CO_2) via the Krebs Cycle to produce much more ATP molecules. ATP provides the energy to drive cellular metabolic reactions and is considered the most important high-energy compounds in cells. Approximately 70% of the energy in the ATP comes from carbohydrate metabolism.

In essence, cells in culture have two primary paths of energy (ATP) production:

- Conversion of glucose to lactate (or full oxidation to CO_2)
- Oxidation of L-Glutamine to CO_2 and ammonia

During aerobic metabolism, pyruvate is integrated into the Krebs Cycle and oxidized to CO_2. However, when oxygen is not present in sufficient quantities, pyruvate is metabolized into lactic acid which can acidify the culture medium when excreted. Therefore, culture media are buffered to neutralize the metabolic by-products, lactic acid and carbon dioxide when they are dissolved in water.

In mammalian cell culture, the growth of cells is dependent upon the presence of carbon and energy sources. In most of the commonly used cell culture media, glucose and glutamine are the major energy sources, whereas glucose is essential for continuous cell attachment to the microcarrier and rate of cell growth, and L-Glutamine provides a significant portion of the energy to maintain cell growth. Media containing glucose should be supplemented with pyruvate for cellular growth especially under conditions of low cell density. A variety of other compounds including pyruvate are added in complex media especially when serum concentration is reduced and they may assist in cloning and in maintaining specialized cells. Recent research has indicated that different pathways for glutamine metabolism are possible resulting in not only different energy output but also ammonia accumulation. This by-product, ammonia, can limit cell growth and product formation. Reducing ammonia accumulation by replacing glutamine with pyruvate supports cell growth without any adaptation for at least 19 passages without a reduction in growth rate of many different adherent commercial cell lines (e.g., MDCK, BHK-21, CHO-K1) in both serum-containing and serum-free media.

We now should be able to see part of the relationship between the CO_2, Lactic Acid, Glucose, Glutamine and Pyruvate and proper physiological pH and the crucial roles each one plays in cell culture.

Cultured cells require a sterile environment and an optimal nutrient supply for growth and viability. Over the years various defined media have been designed, developed, modified and enriched with a wide spectrum of supplementation to support a vast range of cell types. Precise media formulations have been specifically developed by optimizing the concentrations of each and every component which performs a uniquely defined function.

Predominant Characteristics

- Frozen formulation
- Concentration at 100 mM
- Sterile-filtered
- Cell-culture tested
- Endotoxin-tested

Storage and Stability

The product should be kept at **-20°C**.
The product is **light-sensitive** and therefore should not be left in the light.
Shelf life: 24 months from date of manufacture

Procedure

1. Take a bottle from freezer, read the label, and thaw at room temperature.
2. Ensure that the cap of the bottle is tight.
3. Gently swirl the solution in the bottle.
4. Wipe the outside of the bottle with a disinfectant solution such as 70% ethanol.
5. Aliquot the solution (if it is not used at one time) and take appropriate volume using aseptic/sterile technique under a laminar-flow culture hood.

Recommended dilution for use: 1:100 for most cell types

Quality Control

Sodium Pyruvate Solution is tested for sterility, pH, osmolality.

Precaution and Disclaimer

For research use only, not for clinical diagnosis, and treatment.