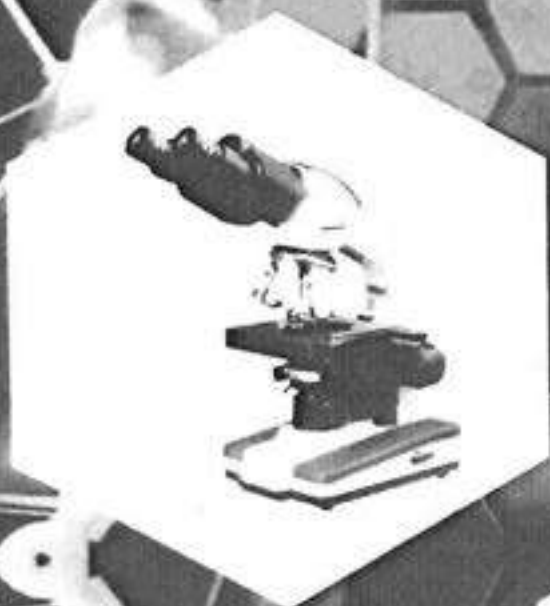


Methods and Tools in Biosciences



Editors
Dr. Anita Gajraj
Dr. Reema Srivastava

Seema
Principal

Kanoria PG Mahila Mahavidyalaya
JAJPUR



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Introduction, Principle, Instrumentation and Application of SDS-PAGE Technique

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Abstract

SDS-PAGE (sodium dodecyl sulphate-polyacrylamide gel electrophoresis) is commonly used in the lab for the separation of proteins based on their molecular weight. It is one of those techniques that is commonly used but not frequently fully understood, therefore the present article is an attempt to provide SDS-PAGE protocol in detail which could be beneficial for learning aspects.

Key-words: SDS-PAGE, protein, principle, reagents, protocol

1. Introduction

SDS-PAGE method is used to study protein based variation among different organisms. It is used to detect various type of protein sub-units of different organism (Zahoor *et al.*, 2005 and Jiang *et al.*, 2006). Seed protein based variation is important for many reasons, as it gives accurate genetic diversity among genotypes, helps in plant domestication, for phylogenetic relationship, and also used as tool for crop improvement (Waddod *et al.*, 2016). This technique is used for separating proteins, based on their ability to move within an electrical current. This is a function of the length of their polypeptide chains or of their molecular weight. In this procedure, an electrical field moves proteins through a gel matrix. SDS-

PAGE, like horizontal agarose gel electrophoreses, separates the molecule of interest (protein in the case) by size. Proteins are amphoteric molecules, i.e. they have both positive and negative charges. To make them move in a single direction a uniform negative charge is created on them. The SDS codes the proteins, mostly proportional to their molecular weight and confers the same negative electrical charge across all the proteins in the sample.

Sodium dodecyl sulfate (SDS or NaDS) is an organic compound with the formula $\text{CH}_3(\text{CH}_2)_{11}\text{OSO}_3\text{Na}$. It is an anionic surfactant used in many cleaning and hygiene products. SDS is a detergent (soap) that can dissolve hydrophobic molecules but also has a negative charge (sulfate) attached to