Technical Data

Code : **MB073**

Product : **Ultra Resolution Agarose, For Molecular Biology (For high resolution separation of 20bp-800bp DNA fragments)**

Appearance : White fine powder

Chemical Analysis :

Gelling temperature (3.0 % Gel)	:	34-35°C
Gelling strength (1.5% gel)	:	1615 g/cm^2
Sulphate (SO_4)	:	0.046 %
Melting point	:	71.2°C
EEO	:	0.11
RNases	:	none detected
DNases	:	none detected

Product information:

Agarose is an unmodified polysaccharide of galactose with neutral charge which is essential to prevent interactions with charged DNA and protein molecules. It forms large pores which is useful for separation of DNA and proteins by its molecular size. In aqueous solution, below 35^{o}C these polymer strands are held together in a porous gel structure by non-covalent interactions like hydrogen bonds and electrostatic interactions. On heating the solution, these non-covalent interactions are broken down and the strands are separated. As the solution cools, these non-covalent interactions are re-established and the gel is formed. Purified agarose is insoluble in water or buffer at room temperature but dissolves on boiling. As it cools, agarose undergoes polymerization i.e., sugar polymers cross-link with each other and cause the solution to solidify, the density or pore size of which is determined by concentration of agarose.

Agarose gel electrophoresis is a method used to separate DNA and RNA molecules according to their molecular size. This is achieved when negatively charged nucleic acids

migrate through an agarose gel matrix under the influence of an electric field (electrophoresis). Shorter molecules move faster and migrate farther than the larger ones. This method is simple, rapid to perform, and capable of resolving fragments of DNA that cannot be separated by other procedures such as density gradient centrifugation. The position of DNA in the agarose gel is visualized by staining with low concentration of fluorescent intercalating dyes, such as Ethidium bromide. In agarose gels, the speed at which nucleic acids migrate toward the positive electrode is affected by electroendo-osmosis. Electro endosmosis (EEO) is a process taking place concurrently with sample migration. The support medium develops a negative charge itself when exposed to an alkaline buffer. The positive ions present in the buffer make a new association with the negatively charged groups. This process is due to ionized acidic groups (usually sulfate) attached to the polysaccharide matrix of the agarose gel. The acidic groups induce positively charged counter ions in the buffer that migrate through the gel toward the negative electrode, causing a bulk flow of liquid that migrates in a direction opposite to that of the DNA. The higher the density of negative charges on the agarose, the greater the EEO flow and the poorer the separation of nucleic acid fragments.