Product Information

Catalog Number	*Product Description*
162-0125-EDU	**High Strength Analytical Grade Agarose**, 100 g
166-0401-EDU	**DNA Electrophoresis Sample Loading Dye**
170-2984-EDU	**Gel Support Film for Agarose**, 50 sheets
161-0733-EDU	**TBE Buffer, 10x,** 1 liter Tris Boric Acid
161-0743-EDU	**TAE Buffer, 10x,** 1 liter Tris Acetic Acid
170-4406-EDU	**Mini-Sub® Cell GT (Agarose Electrophoresis Apparatus)**
165-5050-EDU	**PowerPac 300 Power Supply**

Bio-Safe™ DNA Staining Solution 500x (1.0 ml)

Instruction Manual

Catalog # 166-0400-EDU

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4106099 Rev B

Introduction

Bio-Safe DNA Staining Solution is a safe alternative to ethidium bromide staining of DNA in agarose or acrylamide gels. This dye was developed specifically for classroom applications. It is a non-toxic dye for positive staining of DNA fragments in gels. Bio-Safe stain provides a visible record of the DNA bands in a gel without the need for ultraviolet illumination. This revolutionary product stains DNA bands a deep blue color. It can be used with either agarose or acrylamide gels to produce vivid results, eliminating the requirement for expensive photo-documentation systems and film.

Bio-Safe Stain vs Ethidium Bromide

Bio-Safe DNA stain is a convenient, non-toxic alternative to ethidium bromide staining for the detection of DNA.

Toxicity

Bio-Safe stain is noncarcinogenic, and the waste generated is not considered a bio-hazard.

Expense

Because Bio-Safe stain is fade-resistant, stained gels can be dried on Gel Support Film for Agarose (catalog number 170-2984-EDU) and kept as a permanent record of the electrophoresis experiment. Gels stained with Bio-Safe stain can simply be dried and taped into a lab notebook. Bio-Safe stain provides an inexpensive method for documenting the results of DNA electro-phoresis when performing restriction analysis or DNA fingerprinting.

Time of Staining

Staining with Bio-Safe stain takes longer than ethidium bromide staining. The normal staining time for Bio-Safe stain is overnight. The minimum staining time is ~ 2 hours. Ethidium bromide staining gives instant results.

Sensitivity

The sensitivity of Bio-Safe stain is more than sufficient for most teaching lab applications and for the applications provided in Bio-Rad's teaching lab kits. Bio-Safe stain is approximately 10-fold less sensitive than ethidium bromide. If minute quantities of DNA need to be visualized (*i.e.* 5–50 ng), ethidium bromide is the better alternative. In addition, gels can be stained with first ethidium bromide, followed by Bio-Safe stain, if so desired, so that both documentation systems can be used.

Directions for Use of Bio-Safe DNA Staining Solution

To prepare 1x Bio-Safe DNA staining solution, dilute 1 ml of 500x DNA stain in 499 ml of distilled water in an appropriate size flask. Cover the flask and store at room temperature until ready to use. The recommended volume of 1x Bio-Safe solution needed to stain one 7 x 7 cm or 7 x 10 cm gel is ~ 60 milliliters.

Gel staining can be done in individual staining trays, one per student lab station. Plastic weigh boats work well for this purpose. Agarose gels must be removed from their gel trays in order to be placed in the staining solution. This is easily accomplished by holding the base of the gel tray in one hand, and gently pushing out the gel with the thumb of the other hand. Special attention must be given to supporting the fragile well portion of the gel, since the gel may crack along the well line.

Pour enough stain into the tray to cover the gel completely (~60 ml). Stain the gels overnight in 1x Bio-Safe stain. Shake gels gently for best results. The next day, rinse the stained gel with distilled water and destain for at least 10 minutes. To produce maximum contrast, gels can be destained overnight with distilled water. This stain is non-toxic; however, you should use latex/vinyl gloves while handling gels to keep your hands from being stained blue.

Gels stained with Bio-Safe DNA staining solution can be dried on a Gel Support Film and kept as a permanent record of the electrophoresis. Drying gels is an excellent alternative to photodocumentation.

Note: Normal staining time is overnight. More rapid staining can be accomplished by preparing a 1:200 dilution of Bio-Safe stain (1 ml stain in 199 ml of distilled water) and staining the gels for 1–3 hours. The gels can then be conveniently destained overnight.

Drying Agarose Gels

Drying agarose gels is only recommended when using Bio-Rad's specially formulated High Strength Analytical Grade Agarose. Simply remove the destained gel from the staining tray and place it on the hydrophilic side of a piece of Gel Support Film for Agarose (catalog number 170-2984-EDU). Center the gel on the film and let it air dry at room temperature for 2 to 3 days, until completely dry. As the gel dries, it will bond to the support film and will not shrink. The result will be a flat, transparent, and durable record of the electrophoresis.

Storage

Store concentrated or diluted Bio-Safe staining solutions at 4 °C.