Nucleic Acid Electrophoresis

Protocol

Bulletin 6230

Recipes for TAE and TBE Electrophoresis Buffers

Agarose gels are generally run two types of electrophoresis buffers. Nucleic acid agarose gel electrophoresis is usually conducted with either Tris-acetate-EDTA (TAE) buffer or Tris-borate-EDTA (TBE) buffer. While TAE buffer provides faster electrophoretic migration of linear DNA and better resolution of supercoiled DNA, TBE buffers have a stronger buffering capacity for longer or higher voltage electrophoresis runs.

Note: Because of higher voltages and resulting higher currents often used with Sub-Cell® Model 96 and 192 cells, we recommend that only TBE buffers be used for electrophoresis with these specific systems.

Tris-acetate-EDTA (TAE) buffer

TAE is often prepared in concentrated stock solutions of 10× or 50× in the laboratory. A 1× working solution is prepared prior to electrophoresis.

Composition of 1× TAE buffer

- 40 mM Tris (pH 7.6)
- 20 mM acetic acid
- 1 mM EDTA

Preparation of 50x TEA stock solution

To prepare 1 liter of 50× TAE dissolve following components in 600 ml of deionized water:

- 242 g Tris base (FW = 121)
- 57.1 ml glacial acetic aci
- 100 ml 0.5 M EDTA (pH 8.0)

Adjust the final volume to 1 liter with deionized water.

To prepare a 1× working solution from 50× stock buffer mix 50× stock buffer with DNAse free deionized water at 1:4 ratio.

Tris-borate-EDTA (TBE) buffer

TBE buffer can be made and stored in concentrated stocks of 5× or 10×.

Composition of 1× TBE buffer

- 89 mM Tris (pH 7.6),
- 89 mM boric acid,
- 2 mM EDTA

Preparation of 10x TBE stock solution

To prepare 1 liter of 10× TBE dissolve following components in 600 ml deionized water:

- 108 g Tris base (FW = 121)
- 55 g boric acid (FW = 61.8)
- 40 ml 0.5 M EDTA (pH 8.0)

Adjust final volume to 1 liter with deionized water.

To prepare a 1× working solution from 10× stock buffer, mix 10× stock buffer with DNAse free deionized water at 1:9 ratio.

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