ERIOCHROME BLACK T AS A DYE FOR AGAROSE GEL ELECTROPHORESIS

Department of Molecular Biology, University of Gdańsk, Kładki 24; 80-822 Gdańsk, Poland

We found that it is possible to use eriochrome black T as a dye for agarose gel electrophoresis of DNA. The presence of the dye does not change the migration rate of DNA and does not influence the electrophoretical picture.

Xylene cyanol FF and bromophenol blue are commonly used dyes for electrophoretical gel-loading buffers [1]. These dyes move, in the electric field, toward the anode at predictable rates. Bromophenol blue migrates through agarose gel at approximately the same rate as linear double stranded DNA several hundred base pairs in length. Xylene cyanol FF migrates approximately 2.2-fold slower than bromophenol blue. In some cases, control of migration of smaller DNA fragments is also necessary. Therefore we looked for a new dye which could be useful for gel electrophoresis.

MATERIAL AND METHODS

Electrophoretical dyes, bromophenol blue (Sigma), xylene cyanol FF (Sigma) and eriochrome black T (Polskie Odczynniki Chemiczne), were used. Electrophoresis was run according to Sambrook et al. [1].

RESULTS AND DISCUSSION

We have found that there is a possibility of using eriochrome black T [1-(1-hydroxy-2-naphthylazo)-6-nitro-2-naphtol-4-sulfonic acid sodium salt] as a dye for agarose gel electrophoresis of DNA. The migration of eriochrome black T is faster than that both of xylene cyanol FF and bromophenol blue (Fig. 1). Thus, control of migration of smaller DNA fragments is possible. The presence of eriochrome black T does not change the migration rate of DNA and does not influence the electrophoretical picture (Fig. 2).
Fig. 1. Electrophoresis in 1% agarose gel of the dyes in TAE buffer (40 mM Tris/acetate, 1 mM EDTA, pH 7.8). Lanes: 1, bromophenol blue (BB); 2, bromophenol blue (BB) and xylene cyanol FF (XC); 3, erochrome black T (EB)

Fig. 2. Electrophoresis in 1% agarose gel of λDNA digested with BsrE II. The gel, stained with ethidium bromide (0.5 μg/ml) for 30 min, was photographed over a transilluminator (312 nm wavelength). Lanes: 1, with bromophenol blue as a dye; 2, with bromophenol blue and xylene cyanol FF as dyes; 3, with erochrome black T as a dye
We determined the approximate size of fragments of double-stranded linear DNA with which the dyes comigrate. These values are dependent on the agarose concentration in the gel (Fig. 3).

![Graph showing dependence of comigration of the dyes with linear double-stranded DNA fragments on the agarose concentration in the gel during electrophoresis in TAE buffer: *, xylene cyanol FF; □, bromophenol blue; ●, eriochrome black T]

The dye which we propose has an additional advantage: it is several fold cheaper than either bromophenol blue or xylene cyanol FF [2, 3]. However, we do not recommend eriochrome black T as a dye for polyacrylamide gel electrophoresis.

REFERENCES