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**Non-monotonic mobility vs. length dependence observed in electrophoretic separation of 25 bp DNA ladder in Pluronic gels.** SEUNGYONG YOU, DAVID VAN WINKLE, Department of Physics and Center for Materials Research and Technology, Florida State University — We electrophoresed a double-stranded DNA ladder first in an agarose gel, then in gels of Pluronic F-127 at room temperature. The DNA ladder consisted of 19 discrete fragments ranging in length from 25 to 450 bp at 25 bp increments plus 500 bp. The DNA fragments were first separated in agarose gel and stacked normally with 25 bp having the highest mobility. A single lane of the separated DNA ladder in the agarose gel was inserted at the edge of a Pluronic gel slab. The DNA was electrophoresed from the agarose into the Pluronic gels perpendicular to the original separation axis. Mobilities of DNA fragments increased from 25 bp to 175 bp and then decreased from 175 bp to 500 bp. The 25 bp and 500 bp bands of the ladder had approximately the same mobility in several different Pluronic gel concentrations. Both were slower than most bands in between. The highest mobility fragments with length of 175 bp have 59.5 nm contour length which is about 3.5 times the diameter of a micelle (17 nm). This result suggests a crossover from chromatographic separation to electrophoretic separation for these short DNAs. This research is supported by the state of Florida (Martech) and Research Corporation.

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