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线性聚丙烯酰胺和聚乙烯吡咯烷酮准互穿网络聚合物溶液用于毛细管电泳紫外检测条件下分离DNA片段的深入研究

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摘要 线性聚丙烯酰胺(PAA)和聚乙烯吡咯烷酮(PVP)准互穿网络(quasi-IPN)聚合物溶液被成功用于毛细管电泳紫外检测条件下分离双链DNA片段

(对123bp/124bp片段的分离度为0.76)和单链DNA片段(对123b/124b片段的分离度为0.97). 该quasi-IPN筛分介质粘度小(在25°C

时的粘度为23.5mPa·s)且温度升高粘度下降. 该筛分介质具有动态涂敷能力可直接用于非涂层毛细管柱. 根据实验结果, 柱温和电场强度会明显影响DNA片段在该介质中的迁移行为. 在变性条件下, 最长片段为1353碱基的单链DNA样品可以在40分钟内获得分离, 其中309/310b

片段的分离度为0.88.

关键词 [DNA分离](#), [毛细管电泳](#), [无胶筛分](#), [紫外检测](#), [准互穿网络](#), [聚丙烯酰胺](#), [聚乙烯吡咯烷酮](#)

分类号

Further Study on Separation of DNA Fragments by Capillary Electrophoresis by Quasi-interpenetrating Network of Polyacrylamide and Polyvinylpyrrolidone with UV Detection

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Abstract Quasi-interpenetrating network of polyacrylamide (PAA) and polyvinylpyrrolidone (PVP) had been successfully used for single-base resolution of double-stranded DNA (0.76 for 123 bp/124 bp) and single-stranded DNA fragments (0.97 for 123 b/124 b) with UV detection. This quasi-IPN (interpenetrating network) sieving matrix showed low viscosity (23.5 mPa·s at 25 °C) and decreased with increasing temperature. This polymer also exhibited dynamically coating capacity and could be used in the uncoated capillary. The effects of temperature and electric field strength on the DNA separation of quasi-IPN matrix were also investigated and found that the temperature and electric field strength could markedly affected the mobility behavior of DNA fragments. This polymer matrix has also applied to separate the bigger DNA fragments by capillary electrophoresis with UV detection. Under the denaturing conditions, this matrix separated the samples with last fragment of 1353 base in 40 min, in which the doublet of 309/310 base was partial separated and the resolution was 0.88.

Key words [single-base resolution](#) [capillary electrophoresis](#) [non-gel sieving](#) [UV detection](#) [quasi-interpenetrating network](#) [polyacrylamide](#) [polyvinylpyrrolidone](#)

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