Tube-like motion of ds-DNA in a nanoslit post array  PO-KENG LIN, Institute of physics, Academia Sinica, CHEN-HSIANG HUNG, National Taiwan University, CHIA-FU CHOU, YENG-LONG CHEN, Institute of physics, Academia Sinica — Polymer reptation motion has been observed in polymer trapped in a porous network with pore size smaller than the chain Kuhn length. In this study, we directly observe the tube-like motion of DNA confined in nano-height hexagonal micropost arrays, where the post spacing is much larger than the Kuhn length. The chain length $N$-dependence of DNA diffusivity $D$ exhibits the two-dimensional reptation scaling $D \sim N^{-1.5}$. The tube-like motion results from confinement-induced attraction between DNA and the microposts. We also systematically investigate the transition of DNA-wall interaction from repulsion to attraction.

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