Abstract Submitted
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Linear and ring DNA macromolecules moderately and strongly confined in nanochannels[1] PETER CIFRA, Polymer Institute, Slovak Academy of Sciences, Dúbravská cesta 9, 842 36 Bratislava, Slovakia, ZUZANA BENKOVA, REQUIMTE, Chemistry Department, University of Porto, Rua do Campo Alegre 687, 4169-007 Porto, Portugal, TOMAS BLEHA, Polymer Institute, Slovak Academy of Sciences, Dúbravská cesta 9, 842 36 Bratislava, Slovakia — Understanding the mechanism of DNA extension in nanochannels is necessary for interpretation of experiments in nanofluidic channel devices that are conducted recently not only with linear but also with ring chains. Except reviewing the situation with linear chains we analyze here the experimental results and simulations for the channel-induced extension (linearization) of ring chains. Results of simulations for confined rings indicate that similar transition between moderate and strong confinement as in the case of linear chains exists also for rings. Due to stronger self-avoidance in confined rings the transition and relative chain extension is shifted in comparison to linear DNA. We suggest that similar relation as used in experiments for the extension of linear chains may be used also for circular DNA. For linear DNA in channel relatively stable distinctive events due to chain backfolding, which complicate chain linearization experiments, are analyzed. The abundance of DNA chains folded at the chain ends and in the chain interior was analyzed as a function of the channel width. Z. Benkova, P.Cifra, Macromolecules 45, 2597-2608 (2012) P. Cifra, T.Bleha, Soft Matter 8, 9022-9028 (2012)

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