

Supplementary materials

This document provides the data of simulation of the effective viscosity.

Table 1 Simulation data in Fig. 1

ϕ	$\mu_{eff}/\mu_{out}(\lambda = 1)$	$\mu_{eff}/\mu_{out}(\lambda = 5)$	$\mu_{eff}/\mu_{out}(\lambda = 20)$
0.016	1.005	1.004	1.005
0.040	1.012	1.009	1.033
0.064	1.019	1.015	1.022
0.128	1.018	1.027	1.066
0.192	1.063	1.069	1.116
0.256	1.098	1.131	1.184
0.321	1.153	1.192	1.277
0.385	1.230	1.277	1.363
0.449	1.339	1.399	1.507