Relationship between Particle Focusing and Dimensionless Numbers (*Re* and *Wi*) in Elasto-inertial Focusing

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We performed the particle focusing under viscoelastic fluids in a straight square microchannel based on the so-called "elasto-inertial focusing". Probability distribution functions (PDFs) were obtained at various flow rates (40 – 320 μl/h) and viscoelasticity of medium fluids (0.01 – 1.0 wt% PEO solutions). To evaluate focusing efficiency, the PDF values at the centerline of the channel were plotted as a function of two dimensionless numbers Reynolds number (*Re*) and Weissenberg number (*Wi*), respectively. As a result, the PDF as a function of *Re* does not display any tendency, but a master curve was obtained in the plot of PDF as a function of *Wi*. It might be due to relaxation time which is a typical characteristics of viscoelastic fluid, not like Newtonian fluid. It is also found that PDF value shows maximum value at $Wi = 3.16$. Less than $Wi = 3.16$, the particle focusing increase with increasing *Wi*. However particle not focus any more but scatter more with increasing *Wi* at larger than $Wi = 3.16$. Therefore, *Wi* is a more proper parameter to manipulate elasto-inertial focusing than *Re*.