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Particle Focusing in the Poiseuille Flow of Colloidal Dispersion BOOKUN KIM, JU MIN KIM, Ajou University, SOO-HYUNG CHOI, TAE-YOUNG HEO, Hongik University, SUNG SIK LEE, ETH Zurich, TAE HYEON YOO, Ajou University, SUNHYUNG KIM, LG Chem, SO YOUNG KIM, Ulsan National Institute of Science and Technology — We recently reported the lateral migration and focusing of non-colloidal particles, suspended in the nanoparticle colloidal dispersion, by its normal stress differences in microchannel flow at Brownian-motion-dominant low Peclet number conditions [1]. In this presentation, we will demonstrate the key experimental results of the normal stress difference-driven particle focusing in the colloidal dispersion [1]. We will also show that the experimental results are in consistency with the existing theories on the colloidal rheology [2] and the lateral particle migration [3] in viscoelastic fluid [1]. In addition, it will be demonstrated that the second normal stress difference in the colloidal dispersion generates the secondary flow in non-circular channel and the recently observed viscoelastic properties of blood plasma [4] can be elucidated by the colloidal dynamics of the blood plasma-constituting protein molecules [1]. Finally, we will present the characterization of the viscoelasticity of micelle solution based on the microfluidic methods applied to the colloidal dispersion. **References** [1] Kim *et al.*, *Sci. Adv.* 5, eaav4819 (2019). [2] J. F. Brady and M. Vicic, *J. Rheol.* 39, 545–566 (1995). [3] P. Brunn, *J. Non-Newton. Fluid Mech.* 7, 271–288 (1980). [4] M. Brust *et al.*, *Phys. Rev. Lett.* 110, 078305 (2013).

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