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Novel and facile viscometer using a paper-based microfluidic device¹ HYUNWOONG KANG, ILHOON JANG, SIMON SONG, Dept. of Mechanical Engineering, Hanyang University — In clinical applications, it is important to rapidly estimate the blood viscosity of a patient with a high accuracy and a small sample consumption. Unfortunately, ordinary mechanical viscometers require long analysis time, large volume of sample and skilled person. To address this issue, silicon-based viscometers have been developed, but they are still far from prevail usage in clinical environments due to complexity in process and analysis. Recently, a paper-based microfluidic device is emerged as a new platform for a facile point-of-care diagnostic device due to low cost, disposability and ease of use. Thus, we propose a novel and facile method of measuring a viscosity with a paper-based microfluidic devices and a smartphone. This viscometer utilizes mixing characteristics of two fluid flows in a T-shape channel: one for reference and the other for test fluid. The mixing strongly depends on viscosity difference between the two fluids. Also, the fluids are dyed for colorimetric analysis with a smartphone. We found that the accuracy of viscometer is about 3 percent when it was tested for various glycerin aqueous solutions. More detailed information will be discussed in the presentation.

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Hyunwoong Kang
Dept. of Mechanical Engineering, Hanyang University

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