

International Conference and Exhibition on

Materials Chemistry

March 31-April 01, 2016 Valencia, Spain

Application of ultra-thin flexible glass sheets to microfluidic devices

Yo Tanaka

RIKEN, Japan

Ultra thin glass is a glass sheet with a minimum thickness of a few micrometers fabricated using an overflow fusion downdraw process. In this lecture, application of this very flexible glass sheet to microfluidic devices is presented. Microfluidic technology is a major research field aiming to realize sophistication of analytical experiments. The most popular material in this field is Polydimethylsiloxane (PDMS) due to its low cost, self-sealing, and elastomeric property. However, chemical and physical instability is not enough. By contrast, glass is stable. In analytical field, optical transparency and durability against laser or acoustic wave is significant. But, glass is hard. So, it is difficult to make valves or pumps into a glass microchip. Here, ultra thin glass is used to make such fluidic devices exploiting the flexibility. Microchips were fabricated by wet-etching and thermal fusion to guarantee 100% glass. The valve function in a 100- μm width, 50- μm depth linear channel was then demonstrated. The durable pressure and the response time were comparable to similar PDMS-based valves. Peristaltic pump principle using 4-sequential valves was also demonstrated, and the flow rate was also comparable to conventional PDMS peristaltic pumps. This valve and pump system can be applied to wide range of fields using glass.

Biography

Yo Tanaka received his PhD degree in Engineering at the University of Tokyo in 2007. He worked as an Assistant Professor at the Department of Applied Chemistry, School of Engineering, the University of Tokyo, Japan from 2008 to 2011. He has been working as a Unit Leader at Quantitative Biology Center, RIKEN, Japan, since 2011.

yo.tanaka@riken.jp**Notes:**