Supplementary Figure A

Shaping liquid on a micrometre scale using microwrinkles as deformable open channel capillaries

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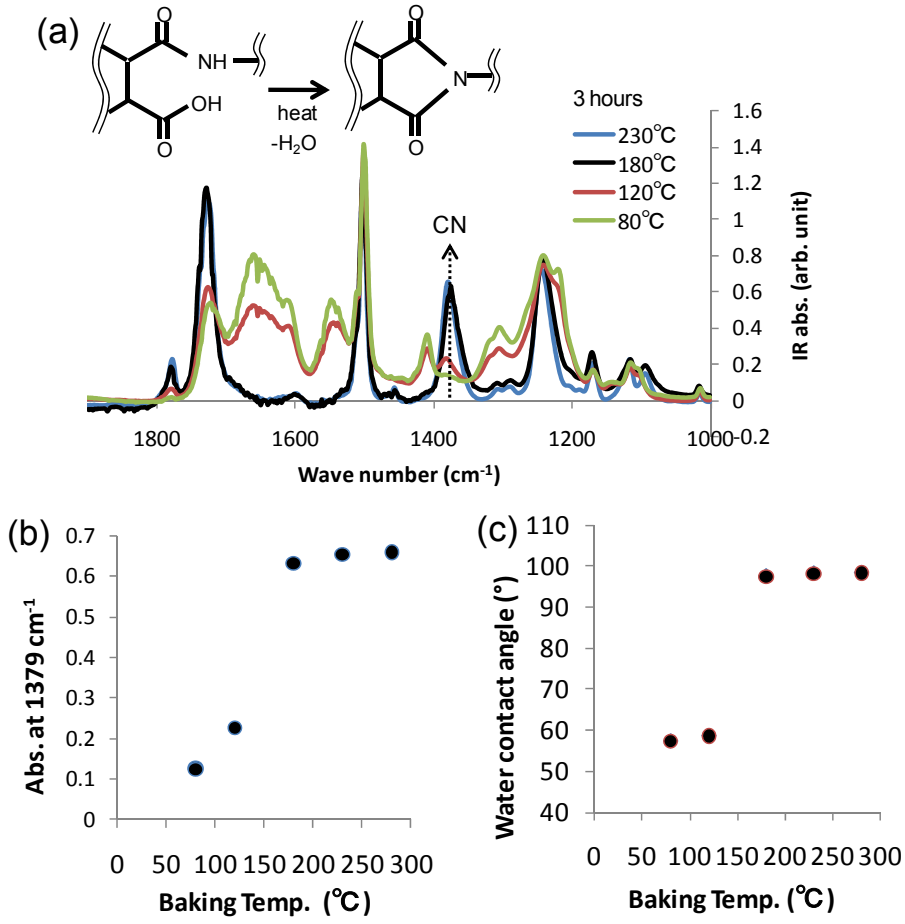
Conversion of amic acid to imide



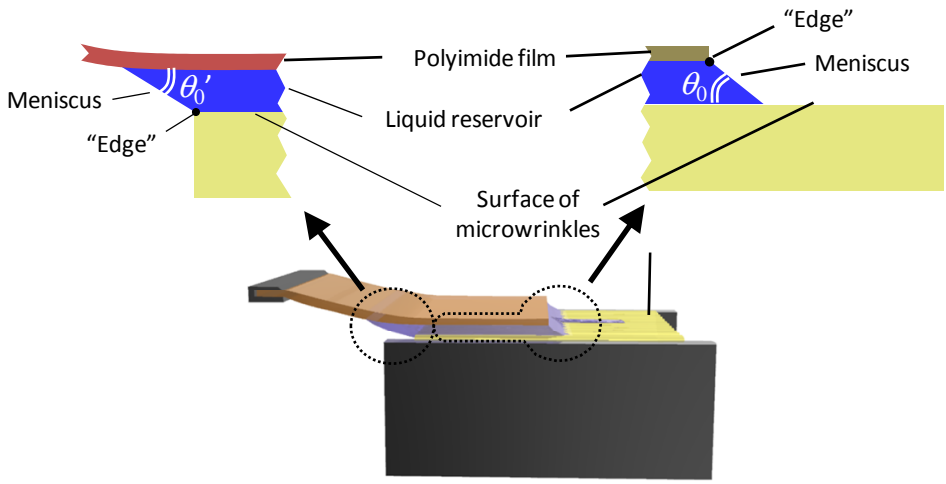
The conversion of the amic acid to the imide form was traced by FT-IR, contact angle measurement, and thermogravimetric analysis. For IR measurements, the spin-coated poly-amic acid films on cover glasses were prepared and baked for 3 hours at 80, 120, 180, 230, and

270°C. The present reaction is a simple dehydration by heat, forming a imide ring [Fig. A(a)]. The IR spectrum [Fig. A(a)] shows an increase of absorption of the peak at 1379 cm^{-1}, which was attributable to the CN stretching vibration of the imide form, as the baking temperature increased. The peak height showed little change at the temperatures higher than 180°C [Fig. A(b)]. The contact angles of a water droplet were also measured on these samples [Fig. A(c)]. The contact angle increases as baking temperature increases, showing a correlation to the IR results. Since the polar substitutes, such as –OH and NH, vanish, it is assumed that the surface energy decreases. These results indicate that the property of the sample baked at 180°C for 3 hours is similar to that baked at 270°C for 3 hours, where most of the imidization is assumed to be completed.

The change in the weight due to the baking was traced by a thermogravimetric analysis. The poly-amic acid solution was firstly baked at 180°C for 3 hours. Then, during the followed baking at 270°C for 3 hours the weight loss was measured. The weight loss, which was probably due to the dehydration, was less than 1%. This result is consistent with the above IR and contact angle measurements, where the imidization reaction almost completes with the condition of baking at 180°C for 3 hours.

Supplementary Figure B

Laplace pressure of reservoir



The meniscus formed between the PI (Kapton®) film and microwrinkles is assumed to have a very small mean curvature H since the contact angles at the "edges" are not fixed to a specific value. The slope of the meniscus is determined by the contact angle of the other surface, θ_0; (slope) ~ $\tan\theta_0$. Since the Laplace pressure $P = \gamma H$, P of the reservoir is assumed to be zero. Moreover, since the thickness of the reservoir is several tens of micrometres, the gravity effect can be neglected here.