Supplemental Material for

Liquid Plug Formation from Heated Binary Mixtures in Capillary Tubes

Cunjing Lv,[1,2] Subramanyan N. Varanakkottu,[3] Steffen Hardt [1*]

[1]Institute for Nano- and Microfluidics, Technische Universität Darmstadt, 64287 Darmstadt, Germany

[2]Department of Engineering Mechanics, Tsinghua University, 100084 Beijing, China

[3]Department of Physics, National Institute of Technology Calicut, 673601 Kozhikode, Kerala, India

Movie legends

TABLE S1. Parameter values corresponding to the videos.

Video #	T_{con} (°C)	d_{in} (mm)	Frame rate (fps)
1	85	1.0	500
2	85	1.0	500
3	87.5	1.0	500
4	96	0.7	15
5	96	0.7	15
6	92.5	1.5	100 000
7	92.5	1.5	40 000

Supplementary Video 1:

After T_b has reached 85 °C and has stabilized, we put fresh mixture into the glass Petri dish under the bottom of the capillary tube, and then raise the Petri dish to let the capillary tube touch the liquid. Immediately, we observe a thin liquid layer climbing the wall of the tube. The inner diameter of the tube is d = 1.0 mm, the recording speed is 500 fps.

* hardt@nmf.tu-darmstadt.de

Supplementary Video 2:

This is an extension of Video 1. After a while, a comparatively thick undulating liquid film is observed. However, plug formation does not occur.

Supplementary Video 3:

The film collapses to form a liquid plug which subsequently moves upwards, while the bottom meniscus moves downwards.

Supplementary Video 4:

Six liquid rings are formed inside the capillary tube. The rings stay at largely fixed positions for most of the time, interrupted by short periods of rapid motion.

Supplementary Video 5:

Two liquid rings collapse to form plugs which subsequently move upwards.

Supplementary Video 6:

High-speed imaging showing the collapse of a liquid ring and formation of a plug.

Supplementary Video 7:

Formation of a liquid plug with subsequent oscillations.