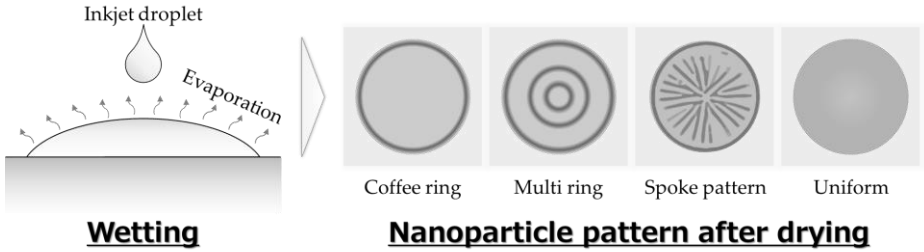
Tohoku Univ. Technology

Multilayer structure and its manufacturing method

A mathematical model was constructed to determine the pattern of nanofluid flow in droplets and the structure of deposited nanoparticle layer.

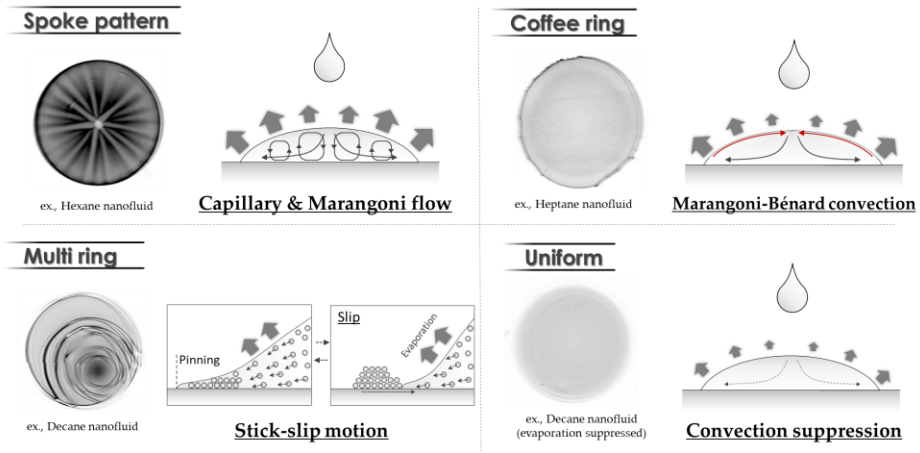


Overview

Recently, nanomaterials, including nanofluids and polymer nanocomposite materials, have been extensively investigated. These materials have diverse applications, such as conductive nano-inks, solar cells, and sensors. In contrast, Inkjet technology offers several advantages, including a simple device configuration, high flexibility in material combination, low environmental impact due to on-demand production, and scalability. These attributes have driven growing interest in printed electronics technology, which applies this technique to the fabrication of electronic circuits and devices.

The present invention enables quantitative evaluation of characteristic patterns that emerge in nanofluid droplets ejected from an inkjet nozzle and adhered to a substrate. By developing a mathematical model governing droplet wetting behavior, it became feasible to design flow patterns within nanofluid droplets and nanoparticle patterns deposited on a substrate. Furthermore, a measurement technique for nanofluid droplets has been successfully developed. (See T24-030).

Fine pattern of droplets



Various patterns and their expression mechanisms

Product Application

- Nanofluid droplet
- Nano ink
- Inkjet technology

Related Works

[1] EITA SHOJI,「Measurement and control of wetting and structure formation in nanofluids」, SCEJ 55th Autumn Meeting, (2024).

IP Data

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