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YOUR NEW ADDRESS FOR E-PRINTS**Simultaneous alignment and micropatterning of carbon nanotubes using modulated magnetic field**Kaoru Tsuda *et al* 2009 *Sci. Technol. Adv. Mater.* **10** 014603 (6pp) doi: [10.1088/1468-6996/10/1/014603](https://doi.org/10.1088/1468-6996/10/1/014603) [Help](#)[PDF \(2.36 MB\)](#) | [References](#)Kaoru Tsuda¹ and Yoshio Sakka²¹ Nano Frontier Technology Co. Ltd, 3-10-6-105 Osaki, Shinagawa-ku, Tokyo, Japan² World Premier International (WPI) Research Center Initiative for Materials Nanoarchitectonics (MANA), National Institute for Materials Science, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, Japan
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Abstract. We report simultaneous alignment and micropatterning of carbon nanotubes (CNTs) using a high magnetic field. It is important to prepare well-dispersed CNTs for alignment and patterning because CNT aggregation obstructs alignment. In magnetic field, highly anisotropic CNTs rotate in the direction stabilized in energy. Owing to their diamagnetic nature, CNTs suspended in a liquid medium are trapped in a weak magnetic field generated by a field modulator; meanwhile, they align to the applied strong magnetic field. The alignment has been achieved not only in polymers but also in ceramic and silicone composites.

Keywords: carbon nanotubes, dispersion, alignment, patterning, magnetic field, diamagnetism, polymer composite, ceramic composite

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