Roll-based Damage-free Transfer Technique of 2D Materials *via* Adhesion Control of Transfer Film

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Since the introduction of graphene, various electronic devices with excellent performance based on two-dimensional (2D) materials have been proposed and demonstrated. In order to commercialize the electronic devices based on 2D materials, it is essential to have a technology to synthesize 2D materials with a large area at low cost[1, 2], as well as a technology to transfer 2D materials from the growth substrate to the target substrate without damage. However, 2D materials are easily damaged during the large-area transfer process, and this damage degrades the excellent electrical and mechanical properties of 2D materials. In this study, we introduce a technique for large-area transfer of 2D materials using roll transfer equipment, investigate the damage mechanism of 2D materials that occurs during the transfer process, and propose a transfer film that can minimize the damage[1].

References

[1] Chan Kim, Min-Ah Yoon, Bongkyun Jang, Hyeon-Don Kim, Jae-Hyun Kim, Anh Tuan Hoang, Jong-Hyun Ahn, Hyun-June Jung, Hak-Joo Lee & Kwang-Seop Kim, NPG Asia Materials, 13 (2021) 44

Figures

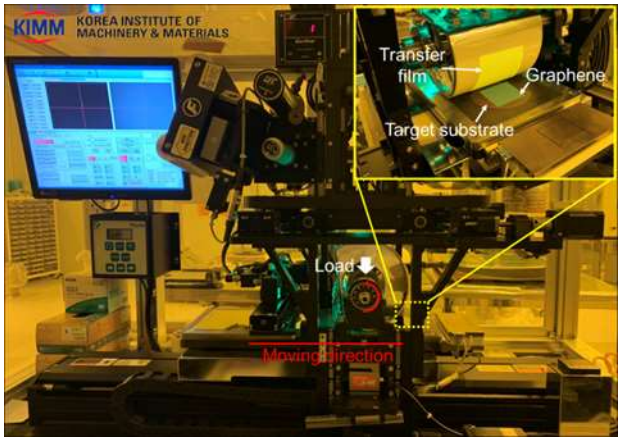

Figure 1: Roll-to-plate transfer machine for dry transfer process of 2D materials

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