

## On-surface chemical reaction and its product studied by high-resolution atomic force microscopy

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Since the first direct observation of the chemical structure of pentacene, atomic force microscopy (AFM) became a powerful tool for surface chemistry [1]. Such high-resolution imaging technique is quite beneficial to identify structures of molecules condensed by the C-H...F hydrogen bonding [2], halogen bonding [3], and two-dimensional metal organic framework [4] and of the doped graphene nanoribbons [5] and novel aromatic compounds [6] synthesized by on-surface chemical reaction. Furthermore, the synthesized products as polyfluorene [7] and graphene nanoribbon [8] can be used for measurement of the mechanical properties, in which the effect of the commensurability and incommensurability plays a role in friction during lifting and sliding the objects.

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[8] S. Kawai et al., *Science* 351, 957 (2016).