

# Towards precision controlled 2D functional group patterning of graphene via laser 'writing'

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The chemical structuring of 2D materials such as graphene enables the specific tailoring of its outstanding properties and due to this, is of uttermost interest for the development of high-performance 2D materials. By applying covalent functionalization with local control, adjacent domains with altering chemical and physical properties can be generated, allowing for a complex pattern design. The so-called laser 'writing' is one of the most promising approaches to achieve this goal. Here, a chemical reaction is locally triggered by a freely movable stimulus such as laser irradiation, allowing for a site-selective functionalization of graphene. We herein present a significant advance in the understanding of the reaction mechanism and the influence of the laser 'writing' parameters in the laser-triggered activation of dibenzoyl peroxide (DBPO) and the subsequent high-precision covalent patterning of functional groups on monolayer graphene.<sup>[1-2]</sup>

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## References

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- [1] T. Nagel, S. Wolff, S. Feng, H. Weber, J. Maultzsch, F. Hauke, A. Hirsch, *Carbon*, *241* (2025), 120376.
- [2] T. Nagel, K. Gerein, F. Hauke, A. Hirsch, *Adv. Sci.* (2025), e11481