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【843】Controlled aggregation of magnetic nanocrystals in Fe-doped GaN

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The control over the aggregation of magnetic ions in a non-magnetic semiconductor matrix constitutes a new way to realize semiconductor/ferromagnetic nanocomposites with yet unexplored but striking functionalities. In this work we show that it is possible to obtain a controlled and well-defined arrangement of single-phase magnetic Fe-rich nanocrystals embedded in a GaN matrix [1]. We observe a phase-separation occurring already above 0.4% of iron ions, leading to the formation of Fe-rich nanocrystals with particular stoichiometry and magnetic properties. The significance of these results is discussed in view of prospects for spintronic devices.

[1] A. Navarro-Quezada et al. Appl. Phys. Lett. 101, 081912 (2012)

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