

## Single Molecule Magnets on Graphene

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Carbon nanostructures are widely recognized as the roots of future electronics showing remarkable mechanical, transport and chemical properties.

Graphene in particular is attracting increasing interest being the set of exotic phenomena i.e. non-local quantum effects, evanescent wave transport and anomalous Hall effect, which only now start to be deepened and could pave the way for unexpected applications.

Additionally, graphene's two-dimensional electron gas is directly exposed to external agents, so that multifunctional nanodevices created by chemical functionalization can be envisaged. However what governs the assembly of macromolecules on graphene and the resulting effect on the hybrids is still largely unknown.

Here we present hybrid nanodevices made of different types of graphene and magnetic molecular clusters exploiting non covalent self-assembly. The properties of the hybrids are investigated by means of AFM, Matrix-assisted TOFMS, Raman,  $\mu$ -SQUID and Transport measurements.

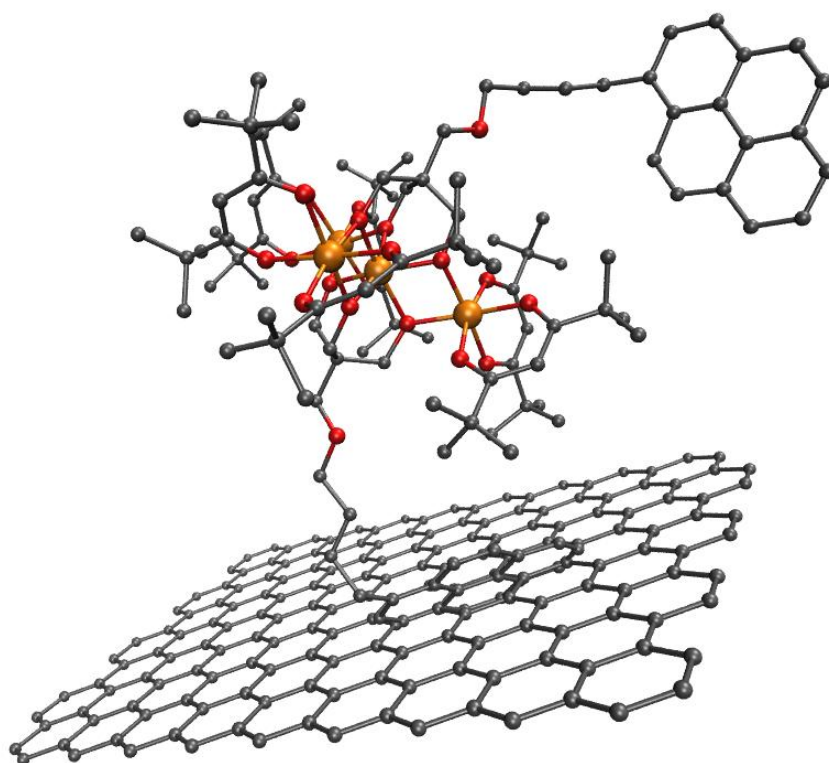
We show that the resulting molecular structures can be governed by the deposition conditions and that the nature of the graphene surface plays a fundamental role.

Eventually, using residual molecular mobility we create molecular random networks on graphene, demonstrating self-reorganization under external stimuli, and we show how the resulting organization affects the magnetization dynamics of the hybrids.

## References

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## Figures



*Fe<sub>4</sub> SMM grafted on graphene.*