***d* metal adsorbed nanoporous graphene**

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Tunable magnetic states of 5[1] PANKAJ KUMAR, Boise State Univ, VINIT SHARMA, FERNANDO REBOREDO, Oak Ridge National Laboratory, PUSHPA RAGHANI, Boise State Univ — Magnetic nanostructures derived from graphene have got a lot of attention for future data storage and spintronic devices. Here, using density functional theory, we investigated the electronic and magnetic properties of 5*d* metal adsorbed di and tri-vacancy fluorinated graphene and studied the effect of external electric field. We find an induced magnetic moment in these systems, which range from 1-7 μ_B. For W adsorbed tri-vacancy fluorinated graphene, we find a huge magnetic moment of 7 μ_B along with high magneto-crystalline anisotropy energy (MAE). Furthermore, the system changes from high spin to low spin under the effect of electric field along with change in MAE. Our study suggests that the defect engineering and external electric field both can be used as a probe to control the magnetic states and magnetic properties of the system. Our results provide a promising way to develop the hybrid materials and control their properties for future spintronic and non-volatile memory devices.

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