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Magnetic moment in single crystalline $BaFe_{2-x}Zn_xAs_2$ YANFENG GUO, International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science, XIA WANG, JUN LI, KAZUNARI YAMAURA, Superconducting Materials Centre, National Institute for Materials Science, EIJI TAKAYAMA-MUROMACHI, International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science — Nature of the magnetism for iron-based superconductors (FeSCs) has been actively studied since the discovery of this new family of compounds in 2008, largely owing to its significance for interpreting the paring mechanism. The approach through impurity substitution to shed light into this issue is always one of major ways. The substitution shows distinct responses to species of impurities, where partially replacement of Fe in parent FeSCs with a variety of *d*-metals like Co, Ni Ru, Rh, Pd, Ir, and Pt generally results in superconductivity, while recent progress in Zn doped FeSCs gives rather contrary result, where Zn severely degenerates the T_C. Herein we show the magnetic and electrical studies on $BaFe_{2-x}Zn_xAs_2$ single crystals. Nonmagnetic Zn doping progressively suppresses the SDW without resulting in superconductivity, while it alternatively develops the spin-glass state, possibly suggestive of local magnetic moment around the Fe sites induced by Zn. The characterizations by X-ray diffraction, magnetic and electrical transport properties, specific heat capacity, and Hall coefficient have been done and the results will be discussed in detail.

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