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(La,AE)(Zn,TM)AsO (AE = Ba, Sr, Ca; TM = Mn): two-dimensional 1111-type diluted magnetic semiconductors in bulk form CUI DING, FANLONG NING, Zhejiang Univ — We successfully fabricated 1111 type bulk form diluted ferromagnetic semiconductors (DMS) with decoupled carriers and spins doping: (La,AE)(Zn,TM)AsO (AE = Ba, Sr, Ca; TM = Mn), of which the Curie temperature TC up to 40 K. We investigated the individual influence of carriers and local moments on the ferromagnetic ordering. We observed that no ferromagnetic order occurs with (Zn,Mn) substitution in the parent compound LaZnAsO without charge doping, but too much carriers suppresses both Curie temperature and saturation moments. The results of muSR measurements indicate that the ferromagnetic order transition takes place in entire volume, namely, these DMSs are bulk nature. The muSR measurements also show an universal linear trend between the static internal field parameter as and the ferromagnetic Curie temperature TC for 1111-type system and other system of DMSs, which suggests that the exchange interaction supporting ferromagnetic coupling in these systems has a common origin.

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