

Abstract Submitted
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High-Mobility Sm-Doped Bi₂Se₃ Ferromagnetic Topological Insulators and Robust Exchange Coupling FENGQI SONG, TAISHI CHEN, XUEFENG WANG, Nanjing Univ — Here we prepare a new type of diluted magnetic semiconductor $(\text{Sm}_x\text{Bi}_{1-x})_2\text{Se}_3\text{Te}_y$. It reaches an anisotropic ferromagnetic phase at $x=0.05$, which exhibits a Curie temperature of around 50K and a typical coercive field of 0.05T. Its magnetic strength and carrier density can be tuned by controlling the dopant ratio of Sm and Te separately. Robust ferromagnetism is demonstrated by the fact that electronic control makes no significant influence on the Curie temperature. The density functional theory calculation supports the ferromagnetism origin from the Sm atoms. The carrier density is $\sim 10^{18}/\text{cm}^3$ and the mobility is over $18000\text{cm}^2/\text{V s}$ with the pronounced Shubnikov de Haas oscillations. This suggests it is a high-mobility candidate of magnetic topological insulators. (*Adv. Mater.* 201501254(2015))

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