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Tuning structure and properties of $BaCr_2As_2$ and $BaFe_2As_2$ by doping in transition-metal sites[1] G. WANG, Institute of Physics, CAS, China; Ames Laboratory/Iowa State University, USA, L. WANG, N. LIU, Z. P. LIN, S. J. SHEN, X. L. CHEN, Institute of Physics, CAS, China, W. R. MEIER, P. C. CANFIELD, Ames Laboratory/Iowa State University, USA — $ThCr_2Si_2$-type structure is common for over 800 compounds and many of them exhibit interesting physical properties, such as superconductivity, quantum critical transition and so on. The typical layered structural feature makes them easier to be tuned in structure and physical properties by structural manipulation, carrier injection, or application of pressure. Here I will present the tuning of structure and physical properties of two $ThCr_2Si_2$-type materials by doping in transition-metal sites. Corresponding single crystals have been grown using flux method in order to access their intrinsic physical properties to a higher extent. For transition-metal doped $BaCr_2As_2$, a clear change of electronic transport behavior has been observed under pressure. While the spin-density-wave anomaly in $BaFe_2As_2$ is effectively suppressed by non-transition-metal doping. The underlying mechanisms for these phenomenons are still under investigation now.

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