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Magnetic, electronic and structural properties of the filled skutterudite $EuFe_4As_{12}$ ANDREAS LEITHE-JASPER, WALTER SCHNELLE, HELGE ROSNER, MIRIAM SCHMITT, YURI PROTS, MPI CPfS Dresden, Germany, ANGELA TRAPANANTI, CORNELIUS STROM, ESRF Grenoble, France, YURI GRIN, MPI CPfS Dresden, Germany — The europium iron arsenide $EuFe_4As_{12}$ with filled skutterudite structure has been synthesized and its structural, electronic, magnetic and thermodynamic properties have been investigated. The Fe and Eu moments order ferrimagnetically at $T_C = 151$ K, the highest magnetic ordering temperature among filled skutterudite compounds. LDA band structure calculations confirm the observed magnetic polarizations and suggest that the conduction electrons in $EuFe_4As_{12}$ have a large spin polarization, albeit lower than in the isostructural $EuFe_4Sb_{12}$. We present a comparative study of the electronic and magnetic properties for both compounds, including the isostructural $EuFe_4P_{12}$, where the exchange of the pnictide can be considered as chemical pressure. To separate the influence of mere volume effects and a change of the pnictide we also studied the behaviour under hydrostatic pressure for $EuFe_4As_{12}$, both experimentally and theoretically.

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