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Fe as Local Probe to follow the Competition between Magnetism and Superconductivity in the New Fe-pnictide Superconductors

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Abstract

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oral

Summary

The ^{57}Fe Mössbauer spectroscopy has been used to follow the appearance of magnetic order and structural transition induced by composition or temperature changes in some Fe-pnictide compounds. In the case of doped compounds by F, K and Na in $\text{CeFeAsO}_{1-x}\text{Fx}$, $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$ and $\text{Sr}_{1-x}\text{Na}_x\text{Fe}_2\text{As}_2$ superconductivity was established. The studies have been performed on some $\text{RFeAsO}_{1-x}\text{Fx}$ ($\text{R} = \text{Ce}, \text{Nd}$) polycrystalline samples of as well as in $\text{Ba}_{0.5}\text{K}_{0.5}\text{Fe}_2\text{As}_2$ and $\text{Sr}_{0.5}\text{Na}_{0.5}\text{Fe}_2\text{As}_2$ single crystal samples. Other Mössbauer studies have shown evidence for magnetism and superconductivity on $\text{Sr}_4\text{V}_2\text{O}_6\text{Fe}_2\text{As}_2$, and $\text{Sr}_4\text{Sc}_2\text{O}_6\text{Fe}_2\text{As}_2$ would show a magnetic ordering without a homogeneous structure. The magnetic transition temperature and the type of transition will be discussed, as well as the coexistence of magnetism and superconductivity.

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