

Abstract submitted to the  
Conference on Concepts in Electron Correlation  
September 24 - 30, 2008 Hvar, Croatia

## Recent Results from Oak Ridge National Laboratory on the Layered Iron Arsenide Superconductors with $T_c = 55$ K <sup>1</sup>

Brian Sales

*Materials Sciences and Technology Division, Oak Ridge National Laboratory, Oak Ridge TN*

Submitted : 29-05-2008

The recent discovery by Kamihara et al. [1] of a layered compound,  $\text{LaFeAsO}_{0.89}\text{F}_{0.11}$  with  $T_c = 26$  K ignited an intense research effort in condensed matter physics laboratories around the world. Within a month, scientists at the Institute of Physics in Beijing had pushed  $T_c$  above 50 K by substituting smaller rare earths (Ce, Pr, Nd, Sm or Gd) for La. The first samples in the US were synthesized and characterized within our group at Oak Ridge [2]. The arsenide superconductors are but a small subset of a much larger class of oxypnictide compounds with the same structure originally discovered by Jeitschko's group in 1994. In this presentation I will discuss our current results and understanding of the properties and physics of the arsenide superconductors, as well as the possible use of these compounds for thermoelectric applications.

[1] Kamihara et al., JACS **130** , 3296, 2008.

[2] Sefat et al., PRB **77** , 174503, 2008.

---

<sup>1</sup>Research done in collaboration with Athena Sefat, Michael McGuire, Rongying Jin, Jane Howe and David Mandrus. Research sponsored by the Division of Materials Sciences and Engineering, Office of Basic Energy Sciences.