

Abstract
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Ternary Superconduct
Materials

Superconductivity in the Er-Fe-Si Ternary System.
C. B. VINING and R. N. SHELTON, Ames Lab.-USDOE* and
Iowa State U.--A new ternary compound with a supercon-
ducting transition temperature of 1.83 K-1.69 K (10%
- 90%) has been identified in the Er-Fe-Si system.
Sixteen samples in the Er-Fe-Si system have been investi-
gated by powder x-ray diffraction, ac susceptibility and
resistivity measurements, revealing at least six distinct
crystallographic phases in the Si-rich region of the ter-
nary phase diagram. Superconductivity in twelve samples
with T_c 's between 1.1 K and 1.8 is attributed to one of
these compounds, with tentative composition Er_2FeSi_4 .
The powder x-ray diffraction data of Er_2FeSi_4 have been
indexed with tetragonal lattice parameters $a=7.74 \text{ \AA}$,
 $c=5.50 \text{ \AA}$ and $c/a \approx \sqrt{2}/2$. This compound has by far the
largest concentration of magnetic rare earth ions (28%
 Er^{3+}) of any known superconductor. Results of microprobe
investigations and the relative phase stability of iso-
structural compounds with other rare earth elements
substituted for Er are reported.

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- () Prefer Poster Session
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Cronin B. Vining
Dept. of Physics,
Iowa State Univers
Ames, Iowa 50011