

Brian C. Sales

ORNL Corporate Fellow and Group Leader
Distinguished Research Scientist
Deputy Lead on Substitutes for the Critical Materials Institute Hub
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Areas of Research: thermoelectrics, magnetism, superconductivity, crystal growth, inorganic synthesis

Bio:

Dr. Sales obtained his PhD in 1974 in condensed matter physics from the University of California at San Diego. His thesis advisor was Bernd Matthias. He joined the staff at ORNL in 1981. Dr. Sales has over 40 years of experience with the synthesis and characterization of unusual electronic and magnetic materials, particularly those involving rare-earth elements. Dr. Sales has authored more than 350 papers, six patents and five book chapters. His work has been cited more than 22,000 times and his current *h* number is 75 (Google Scholar-July 1, 2015). Fifty of his papers have been cited more than 100 times, and Sales is the first author on 13 of those. The highly cited papers are on new thermoelectric materials, superconductivity, unusual magnetic phenomena, oscillatory catalytic reactions, batteries, and nuclear waste storage. Sales has also worked on materials for the disposal of nuclear waste, developed techniques for measuring intermediate range order in phosphate glasses, and contributed to our understanding of the role of phosphate in biopoesis, and the role of glass forming liquids in the cryopreservation of drosophila.

Professional Activities and Awards:

- 2014 Thompson-Reuters list of influential researchers – Recognizes highly cited physics papers between 2002 and 2012 –only 5 made list at ORNL and only 140 scientists worldwide
- Member of Advisory Board for MIT EFRC on Solid State Solar Thermal Energy Conversion- 2010-2014
- Deputy Lead for “Substitutes”- Critical Materials HUB- 2013-present

- Member of Fellowship Committee for the Division of Materials Physics, American Physical Society- 2013, 2014
- Gordon Battelle Prize 2011
- Director's Award, Research, Team 2009
- Distinguished Scientist Award 2007
- Technical Achievement Award (LMES, UT-Battelle) 1995, 1997, 2000, 2001
- Technical Publication Award 1992
- Fellow of The American Physical Society 1998
- IR-100 Award winner, 1985
- Science Digest-100 Most Significant Technological Achievements in 1984-1985
- Inventor of the Year 1985, Oak Ridge National Laboratory
- Significant Implications for Energy Technology in Solid State Physics Award, 1984 DOE Materials Sciences Research Competition
- Member, American Chemical Society
- Member, Materials Research Society
- Member, Editorial Advisory Board of the "Journal of Physics and Chemistry of Solids"

Patents:

- **4,847,008** "Lead iron phosphate glass as a containment medium for disposal of high-level nuclear waste."
- **4,847,219** "Novel lead-iron phosphate glass"
- **4,699,889** "Lead phosphate glass compositions for optical components"
- **5,298,329** "Alkali-lead-iron phosphate glass and associated method"
- **5,812,729** "Very high numerical aperture light transmitting device"
- **5,968,877** "High Tc YBCO superconductor deposited on biaxially textured Ni substrate"

Selected 10 Favorite Publications (for all 350+ publications, see [Google Scholar- Brian Sales](#)):

1. B. C. Sales, J. E. Turner, M. B. Maple, "Oscillatory oxidation of CO over Pt, Pd and Ir catalysts: theory," *Surface Science* **114**, 381 (1982)
2. B. C. Sales, D. Mandrus and R. K. Williams, "Filled Skutterudite Antimonides: A New Class of Thermoelectric Materials," *Science* **272**, 1325 (1996)
3. B. C. Sales, B. C. Chakoumakos, R. Jin, J. R. Thompson, D. Mandrus, "Structural, magnetic, thermal and transport properties of X₈Ga₁₆Ge₃₀ (X= Eu, Sr, Ba) single crystals, *Phys. Rev. B.* **63**, 2451143 (2001).
4. B. C. Sales, B. C. Chakoumakos, D. Mandrus, J. W. Sharp, "Atomic displacement parameters and the lattice thermal conductivity of clathrate-like thermoelectric compounds," *J. Solid State Chem.* **146**, 528 (1999)
5. R. P. Hermann *et al.* "Direct experimental evidence for atomic tunneling of europium in crystalline Eu₈Ga₁₆Ge₃₀," *Phys. Rev. Lett.* **97**, 017401 (2006)

6. B. C. Sales, A. F. May, M. A. McGuire, M. B. Stone, D. J. Singh, D. Mandrus, "Transport, thermal, and magnetic properties of the narrow gap semiconductor CrSb₂," *Phys. Rev. B.* **86**, 235136 (2012).
7. B. C. Sales, M. A. McGuire, A. S. Sefat, D. Mandrus, "A semimetal model of the normal state magnetic susceptibility and transport properties of Ba(Fe_{1-x}Cox)₂As₂," *Physica C* **470**, 304 (2010)
8. B. C. Sales, B. C. Chakoumakos, L. A. Boatner, J. O. Ramey, "Structural properties of the amorphous phases produced by heating crystalline MgHPO₄•3H₂O," *J. Non-Crystalline Solids* **159**, 121 (1993).
9. B. C. Sales, J. E. Turner, and M. B. Maple, "Sublimation Rate of Cobalt near its Curie Temperature," *Phys. Rev. Lett.* **44**, 586 (1980).
10. B. C. Sales, J. O. Ramey, L. A. Boatner and J. C. McCallum, "Structural Inequivalence of the Ion-Damaged-Produced Amorphous State and the Glass State in Lead Pyrophosphate," *Phys. Rev. Lett.* **62**, 1138 (1989).