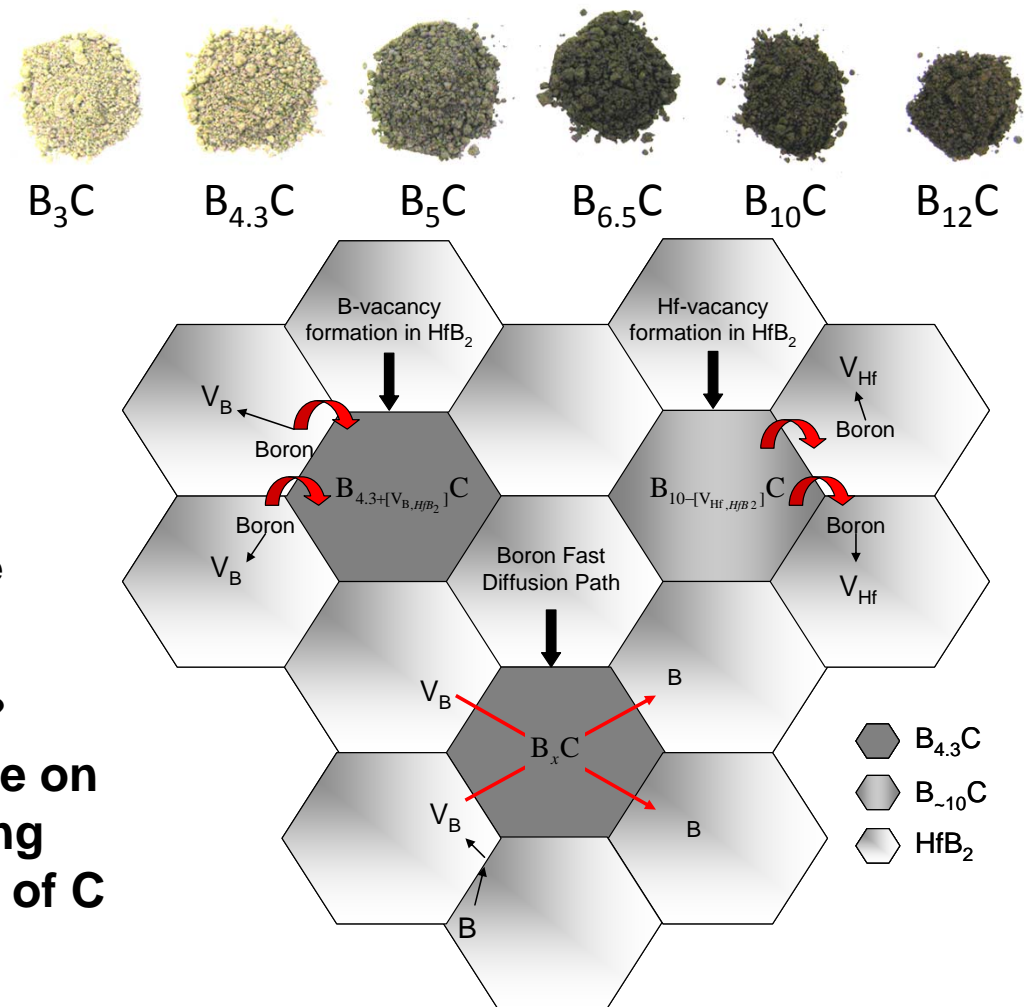


Solid Solution and Isotope Effects on the Properties of Boride Ceramics

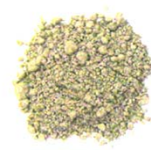
William G. Fahrenholtz and Gregory E. Hilmas
Missouri University of Science and Technology

DMR 0906584

- The project goal is to investigate the effects of carbon content, metal solid solution additions, and boron isotope ratio on diboride ceramics
- Hypotheses being investigated
 - Can C-free diborides be synthesized?
 - What impacts do carbon and other impurities have on thermal properties?
 - Can thermal properties be improved?
 - Why do solid solution additions improve oxidation resistance?
 - Can thermal properties and oxidation resistance be improved simultaneously?
- Significant progress has been made on understanding the role of B_4C during densification of HfB_2 and the effect of C content on ZrB_2 processing



B_3C



$B_{4.3}C$



B_5C



$B_{6.5}C$



$B_{10}C$



$B_{12}C$

- **The project goal is to investigate the effects of carbon content, metal solid solution additions, and boron isotope ratio on the thermal properties and oxidation behavior of diboride ceramics**