Investigation of Phase Relations and Reaction Pathways in Pnictide Superconductors

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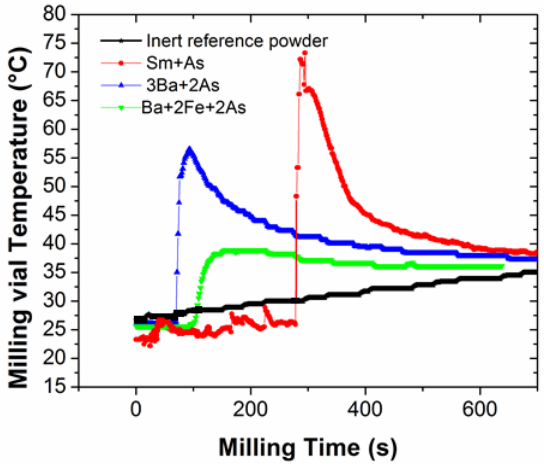
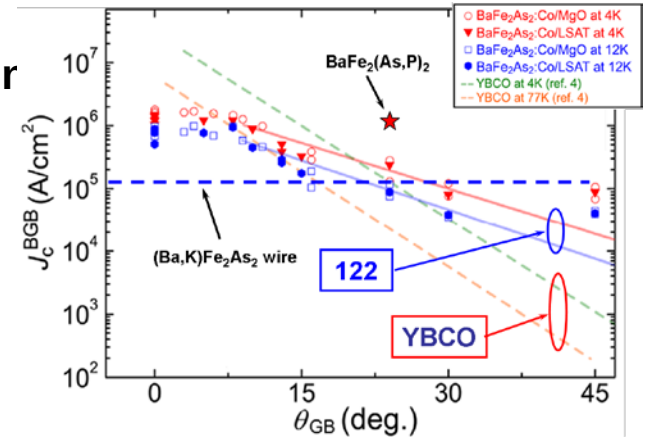
- **Investigate all potential high-temperature superconductors (HTS)**
- **Focus on cuprates and pnictides**
- **Developed pathway to form pnictides – mechanically activated self-sustaining reaction**
- **Currently studying $BaFe_2As_2$**
  - **Polycrystalline bulk - FSU**
  - **Thin films UW-Madison and Temple (Bicrystals, superlattices)**
- **Studying transport across grain boundaries, which is a key weakness in HTS**
- **REU students (UPRM) refurbished DTA for phase studies (2011); building a calorimeter (2012)**



- **Build calorimeter to investigate thermodynamics of pnictide reactions**

Bicrystals - Current decreases with increasing grain boundary angle



Polycrystal - Current in (Ba,K)-122 crosses high-angle grain boundaries