

Mechanical Properties of Three Iron Based Bulk Metallic Glass Alloys



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(Isn't today a holiday. . . ?)

CALTECH



Glassy Metals

- High Intrinsic Q Factor
 - » Low thermal noise
- Very Strong
 - » Can be made very thin
 - Lower the effective Q factor
- Can potentially be used in mirror suspension
 - » Fabricate flex joint

Compositions

- **Co5** - Fe₆₁Y₂Zr₈Co₅Cr₂Mo₇B₁₅
- **Co6** - Fe₆₁Y₂Zr₈Co₆Al₁Mo₇B₁₅
- **Co7** - Fe₆₁Y₂Zr₈Co₇Mo₇B₁₅

Arc Melter



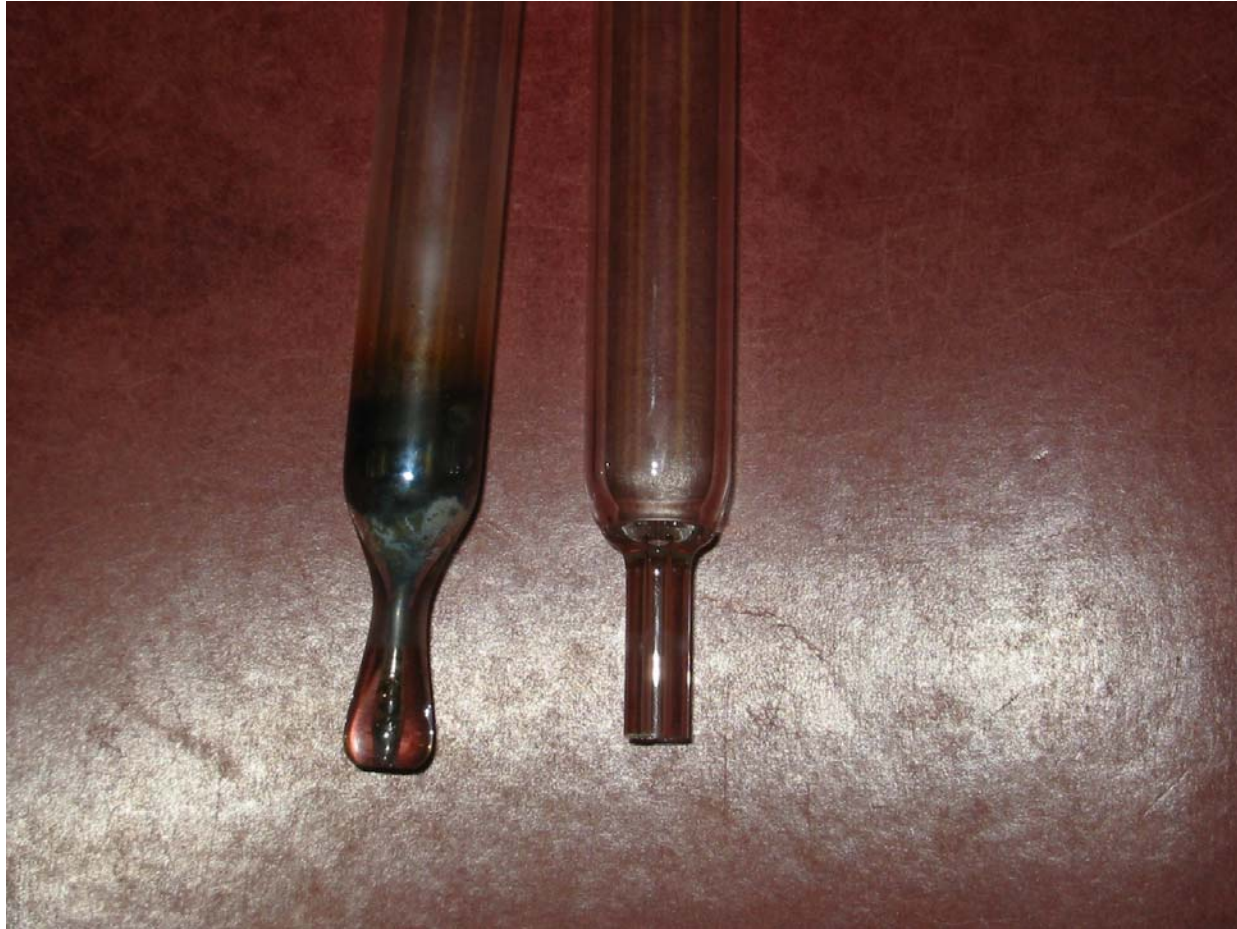
Casting Box



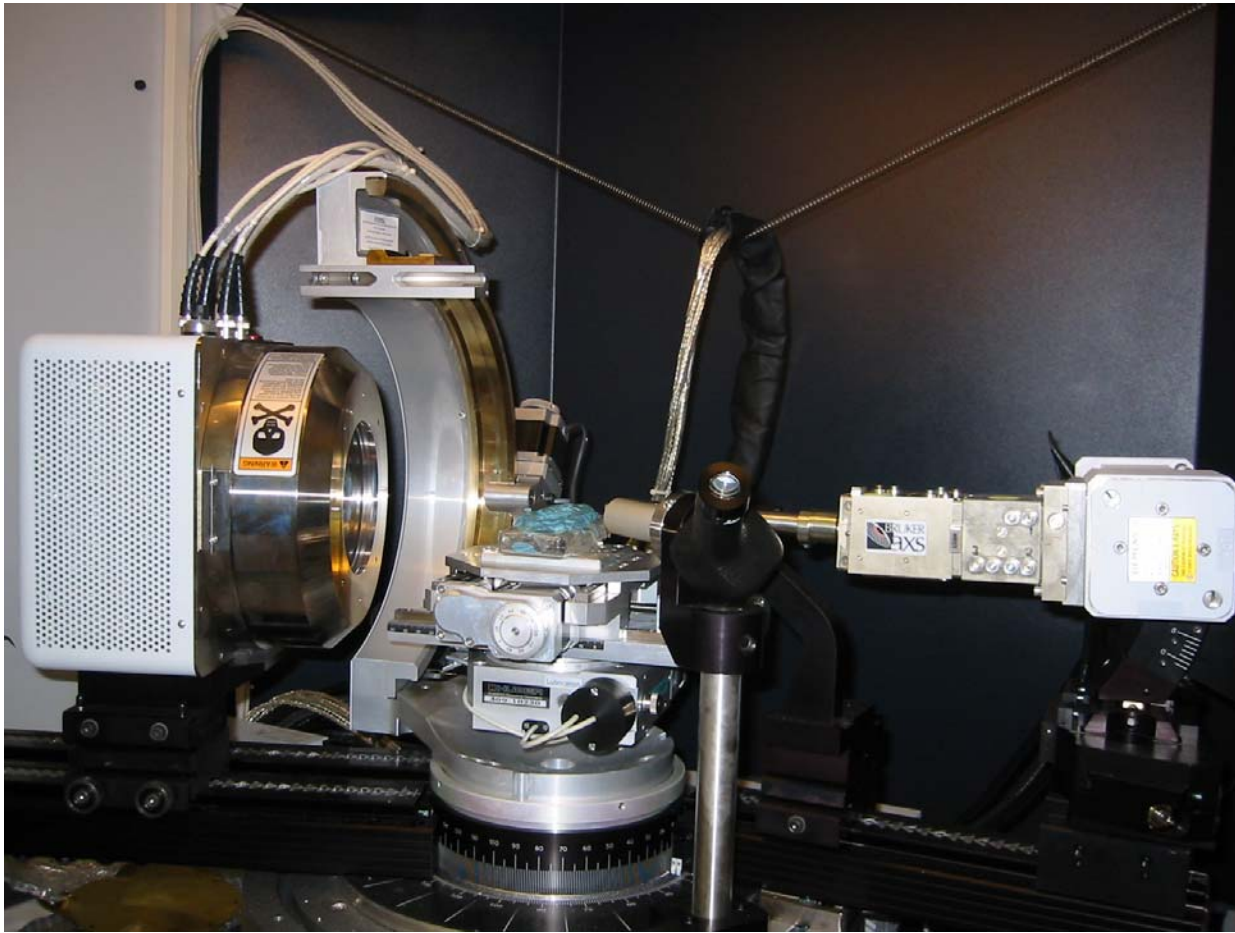
Casting Box



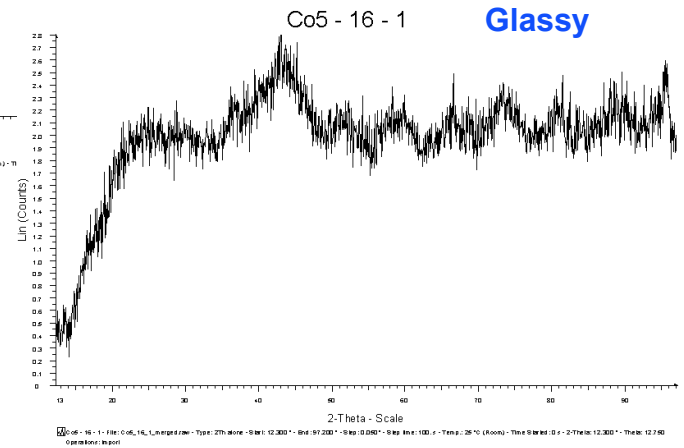
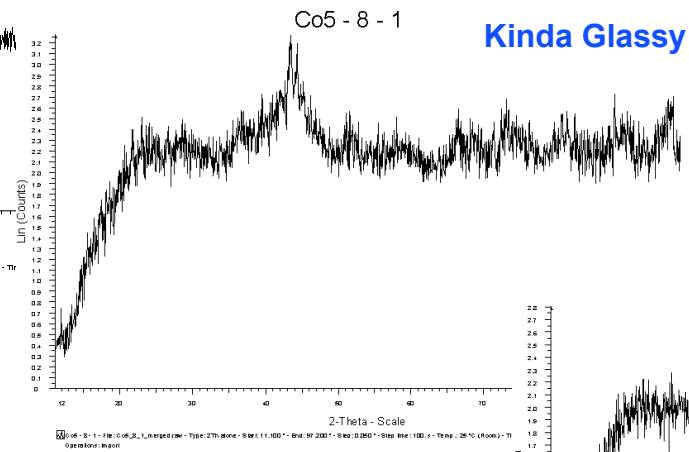
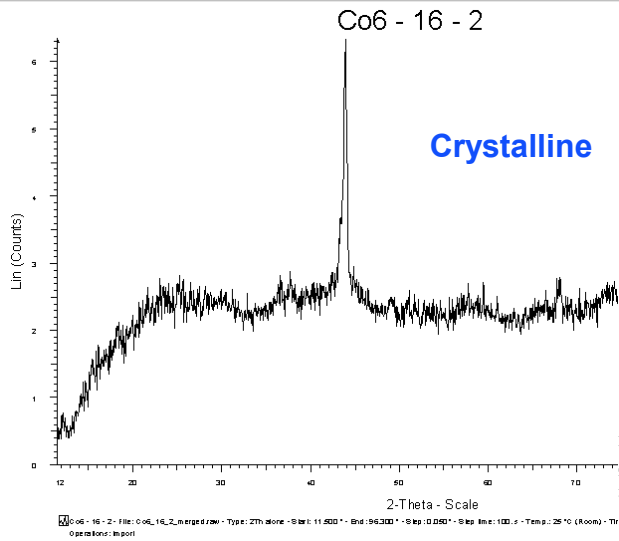
Nozzles



X-Ray Analysis



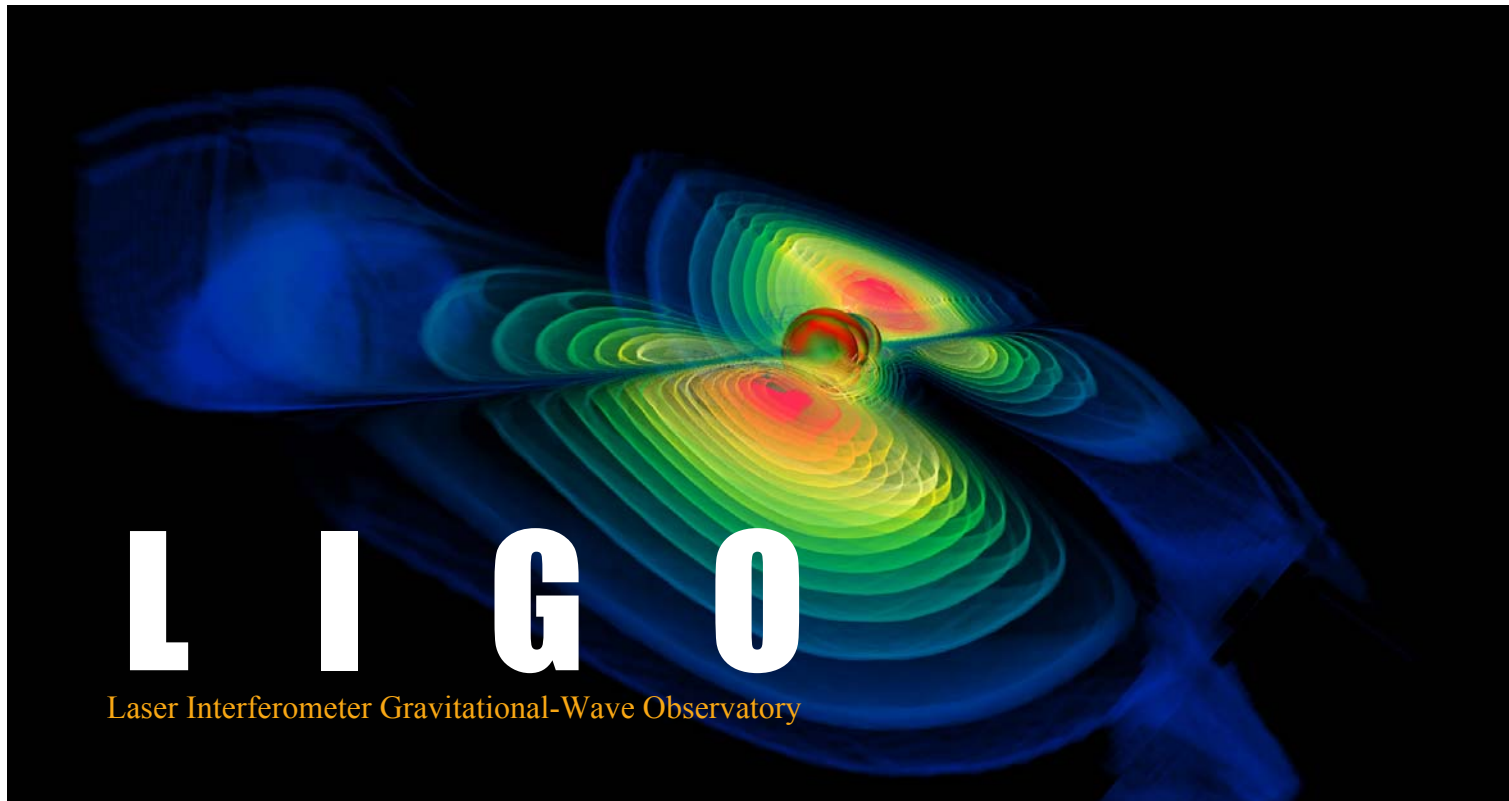
X-Ray Spectra



Data

Alloy	Q Factor	Tensile Strength [GPa]	Effective Q Factor
Co5	3.9×10^4	3.69	
Co6	2.2×10^4	3.42	
Co7	2.1×10^4	3.32	

Thanks



Special Thanks to Riccardo



Picture Courtesy of Mike Hall

Questions?

