

**Application for Graduate Student Travel Scholarship to COMPRES 2016 Annual**

**Meeting, Santa Ana Pueblo, NM**

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## **Synchrotron XANES measurement of W oxidation state in high pressure metal–silicate partitioning samples**

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The abundances of refractory, moderately siderophile elements in Earth's mantle were set during metal–silicate equilibration in a magma ocean as the planet accreted material through impacts early in solar system history. The details of core formation and differentiation can be better understood by experimentally constraining the pressure, temperature and chemical dependence of metal–silicate partitioning of these elements. The oxidation states of cations in the silicate melt are integral to describing metal–silicate equilibrium, but the oxidation states of some elements have been shown to deviate from those commonly observed at the surface under the high  $P$ - $T$  conditions relevant to core formation. Here we report synchrotron X-ray near edge structure (XANES) measurements of W in the silicate melts of several metal–silicate partitioning samples recovered from the laser-heated diamond anvil cell at lower mantle  $P$ - $T$  conditions. Of the two samples measured, one (recovered from 50 GPa, 3800 K and IW-0.66) contained W in the 6+ oxidation state, while the other (recovered from 28 GPa, 3800 K and IW-0.77) appeared to have a mixed valence of 4+ and 6+. Thus, the exchange reaction between W and Fe over a large range of differentiation conditions is best described as mixed valence.

I am currently finishing up my fourth year of graduate school in mineral physics at the University of Chicago. The COMPRES 2016 Annual Meeting will allow me the opportunity to network with experts in my field. Also, the material I am presenting will be submitted as a paper soon, and it will be valuable for me to get feedback on the topic.