

# Hafnium-tungsten Chronometry of Iron Meteorites

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## Introduction

Hafnium-tungsten chronometry can provide chronological information of the metal-silicate segregation at the early stage of the solar system evolution. Precise W isotopic analysis revealed that the timing of the metal-silicate segregation was different among the chemical groups of the iron meteorites. The  $^{182}\text{W}/^{184}\text{W}$  ratios of magmatic irons were slightly lower than those of Ca-Al-rich inclusions (CAIs) in Allende.<sup>[1-4]</sup> This has been considered that the variations of  $^{182}\text{W}/^{184}\text{W}$  ratios in iron meteorites were induced by GCR.<sup>[5]</sup> In order to evaluate the nuclear effects, we have measured  $^{182}\text{W}/^{184}\text{W}$  and  $^{183}\text{W}/^{184}\text{W}$  ratios for 14 iron meteorites of various chemical groups.

## Results and Discussion

The resulting  $^{182}\text{W}/^{184}\text{W}$  ratios of non-magmatic irons (IAB-IIICD) showed slightly higher than those of magmatic irons (IIAB and IIIAB), and this is consistent with the recently published data.<sup>[2-4]</sup> This indicates that it is possible that the components of IAB-IIICD irons were produced by metamorphism, partial melting and incomplete differentiation at the planetary growth stage. Moreover, we confirmed that the  $^{182}\text{W}/^{184}\text{W}$  ratios of some iron meteorites were significantly lower than those of CAIs. In the case of IVB irons, although the  $^{182}\text{W}/^{184}\text{W}$  ratios of Santa Clara and Hoba were in good agreement with the literature data within the analytical uncertainties, the  $^{182}\text{W}/^{184}\text{W}$  ratios of Tlacotepec showed clearly higher than the reported values.<sup>[1,3-4]</sup> In addition, the  $^{183}\text{W}/^{184}\text{W}$  ratios of these iron meteorites did not show any variation. This probably indicates that the nuclear effects onto the W isotopes were small. These variations in the  $^{182}\text{W}/^{184}\text{W}$  ratios of the iron meteorites and CAIs might be reflected by nuclear effects. In order to evaluate these effects, both  $^{182}\text{W}/^{184}\text{W}$  and  $^{183}\text{W}/^{184}\text{W}$  ratios must be precisely determined. In this poster, we will present high-precision W isotopic analysis techniques and will discuss the possible mechanism for the variations in  $^{182}\text{W}/^{184}\text{W}$  ratios.

## References

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