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TUNGSTEN ISOTOPIC COMPOSITIONS IN STARDUST SiC GRAINS FROM AGB STARS: AN EVALUATION OF REACTION RATES AT THE Hf-Ta-W-Re-Os REGION

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Content
Recent s-process analyses of the Hf-Ta-W-Re-Os region have identified two major problems. First, it appears that model predictions underestimate the slow neutron capture (*s*-process) contribution to 182W and, consequently, the 182W rapid neutron capture (*r*-process) residual shows a significant positive deviation from the otherwise smooth *r*-process solar abundance pattern. Second, analysis of the *s*-process flow at the 185W branching point shows that the 186Os *s*-process abundance is also somewhat problematic, indicating a significant overproduction with respect to its solar abundance. These problematic *s*-process abundances and, consequently, the inferred 182W *r*-residual, may reflect remaining uncertainties related to neutron-capture reaction and beta decay rates. We present new data on the W and Hf isotopic compositions in meteoritic stardust silicon carbide (SiC) grains believed to have condensed in the outflows of low mass (~ 1.5 to 3 solar masses) carbon-rich asymptotic giant branch (AGB) stars of metallicity close to solar. These measured compositions show the clear signature of the *s*-process and can be used to infer new information on the *s*-process contribution in the Hf-Ta-W-Re-Os region and on the 182W and 186Os problems. We will present a detailed comparison of the SiC data to *s*-process models with the aim of providing predictions for the neutron-capture reaction rates of the W isotopes.