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New Targets for New Accelerators[1] BRYCE FRENTZ, Concordia College and University of Notre Dame, KHACHATUR MANUKYAN, ANI APRAHAMIAN, University of Notre Dame — New accelerators, such as the 5MV Sta Ana accelerator at the University of Notre Dame, will produce more powerful beams up to 100's of μAmps. These accelerators require a complete rethinking of target preparation since the high intensity of such beams would melt conventional targets. Traditionally, accelerator targets are made with a tantalum backing because of its high atomic mass. However, tantalum is brittle, a poor conductor, and, if produced commercially, often contains impurities (e.g. fluorine) that produce undesirable background and reaction products. Tungsten, despite its brittle structure and poor conductivity, has a high atomic mass and lacks impurities, making it a more desirable backing. In conjunction with tungsten's properties, copper is robust and a far superior thermal conductor. We describe a new method of reactive joining that we developed for creating targets that use the advantageous properties of both tungsten and copper. This process involved placing a reactive mixture between tungsten and copper and applying a load force. The mixture is then ignited, and while under pressure, the system produces conditions to join the materials. We present our investigation to optimize the process of reactive joining, as well as some of the final target's properties.

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