

Abstract Submitted
for the TS4CF08 Meeting of
The American Physical Society

Alternative alloys for platinum jewelry? New structures in Pt-Hf and Pt-Mo ERIN GILMARTIN, JACQUELINE CORBITT, GUS HART, Brigham Young University — The only known intermetallic structure with an 8:1 stoichiometry is that of Pt₈Ti. It is intriguing that an ordered compound would occur at such low concentrations of the minority atom. But this structure occurs in about a dozen binary intermetallic systems. The formation of an ordered structure can significantly enhance the performance of the material, particularly the hardness. Pt- and Pd-rich ordered structures have been experimentally studied in the systems Pt/Pd-X where X is Ti, V, Cr, Zr, Nb, M, Hf, Ta, and W. We took a broader look at 80 Pt/Pd rich alloys to find new candidates for the 8:1 structure and have found about 20. In order to verify our predictions, we used the cluster expansion to find the stable structures. We first applied the cluster expansion to Pt-Hf and Pt-Mo because these two candidates are the most likely to form the 8:1 structure. These new candidates can have applications in the jewelry and catalysis industries.

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Date submitted: 19 Sep 2008

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