Abstract Submitted
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$Ti_{1-x}Au_x$ Alloys: Hard Biocompatible Metals and Their Possible Applications[1] ETERI SVANIDZE, Rice University, TIGLET BESARA, Florida State University, M. FEVZI OZAYDIN, Texas A&M, YAN XIN, KE HAN, Florida State University, HONG LIANG, Texas A&M, THEO SIEGRIST, Florida State University, EMILIA MOROSAN, Rice University — The search for new hard materials is often challenging from both theoretical and experimental points of view. Furthermore, using materials for biomedical applications calls for alloys with high biocompatibility which are even more sparse. The $Ti_{1-x}Au_x$ ($0.22 \leq x \leq 0.8$) exhibit extreme hardness and strength values, elevated melting temperatures (compared to those of constituent elements), reduced density compared to Au, high malleability, bulk metallicity, high biocompatibility, low wear, reduced friction, potentially high radio opacity, as well as osseointegration. All these properties render the $Ti_{1-x}Au_x$ alloys particularly useful for orthopedic, dental, and prosthetic applications, where they could be used as both permanent and temporary components. Additionally, the ability of $Ti_{1-x}Au_x$ alloys to adhere to ceramic parts could reduce the weight and cost of these components.

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