

---

Special Interest Seminars | SIS5 MIM Challenges for New Materials

## [SIS5]MIM Challenges for New Materials

Special Interest Seminars

Chairpersons: Kentaro Kudo (Kyushu University, Japan), Animesh Bose (AMfgLabs LLC, USA)

Tue. Oct 15, 2024 10:45 AM - 12:05 PM Room D (3F 304, Conference Center)

---

11:25 AM - 11:45 AM

### [15D-SIS5-03]The Influence of Mo Additions on Physical, Microstructure and Mechanical Properties in Commercially Pure Ti Manufactured by MIM Process

\*M. Tange<sup>1,2</sup>, C. Suwanpreecha<sup>3</sup>, S. Songkuea<sup>3</sup>, A. Manonukul<sup>3</sup> (1.Taisei Kogyo (Thailand) Co., Ltd., Thailand, 2.Micro MIM Japan Holdings Inc., Japan, 3.National Metal and Materials Technology Center (MTEC), National Sciences and Technology Development Agency, Thailand)

Keywords:CP-Ti; Mo; sintering; mechanical properties

Molybdenum (Mo) is one of the beta-phase stabilisers in titanium, garnering significant interest by modifying the properties of commercially pure Ti (CP-Ti) suitable for biomedical applications. In this study, 0, 5, 7.5, 10, 15 wt.% of Mo were added to CP-Ti and sintering at 1100, 1150 and 1250 °C for 4 h were applied the metal injection moulding (MIM) process. The sintered specimens' properties were evaluated through density, impurity contents, microstructure, tensile testing, and observation of the fracture surfaces. The results indicate that higher Mo contents lead to an increased amount of beta phase and higher tensile strength from 600 to 1100 MPa with 0 to 15 wt.% Mo. However, excessively high Mo content contributes to low ductility due to the formation of TiC precipitated at the grain boundaries. In this study, the 5 wt.% Mo addition specimen shows the most balanced mechanical properties.