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1. Research Summary

1) The effects of chemical compositions and interstitials were revealed for several Ni-free titanium based shape memory alloys containing Cr, Nb and/or Mo.
2) The effect of elastic constrictive stress of polymer matrix on magnetic motion of NiMnGa particles was investigated for ferromagnetic shape memory alloy particle dispersoids polymer matrix composites.
3) The effects of chemical composition on shape memory and superelastic properties and diffusion behavior were investigated for Au-based shape memory alloys.

2. Publication list

1) T. Inamura, Y. Yamamoto, H. Hosoda, H. Y. Kim and S. Miyazaki, “Crystallographic orientation and stress amplitude dependence of damping in the martensite phase in textured Ti-Nb-Al shape memory alloy”, Acta Materialia, 58, (2010) 2535-2544.

2) Y. Al-Zain, H. Y Kim, H. Hosoda and S. Miyazaki, “Shape memory properties of Ti-Nb-Mo biomedical alloys”, Acta Materialia, 58 (2010) 4212-4223

3) T. Inamura, H. Hosoda, H. Y. Kim and S. Miyazaki, “Antiphase boundary-like stacking fault in alpha”-martensite of disordered crystal structure in beta-titanium shape memory alloy”, Philosophical magazine, 90 (‘2010) 3475-3498

4) M. Tahara, H. T. Kim, H. Hosoda and S. Miyazaki, “Effect of nitrogen addition and annealing temperature on superelastic properties of Ti-Nb-Zr-Ta alloys” Mat. Sci. Eng. A, 527 (2010) 6844-6852.

5) Y. Yamabe-Mitarai, Y. Hara, T. Miura and H. Hosoda, “Shape memory effect and pseudoelasticity of TiPt”, Intermetallics, 18 (2010) 2275-2280

6) H. Kanetaka, Y. Shimizu, T. Kudo, Y. Zhang, M. Kano, Y. Sano, H. Ichikawa, H. Hosoda and S. Miyazaki, “New Internalized Distraction Device for Craniofacial Plastic Surgery Using Ni-Free, Ti-Based Shape Memory Alloy”, J. Craniofacial Surgery, 21 (2010) 1839-1842

7) Y. Al-Zain, H. Y. Kim, T. Koyano, H. Hosoda and S. Miyazaki, “Anomalous temperature dependence of the superelastic behavior of Ti-Nb-Mo alloys”, Acta Materialia, 59 (2011) 1464-1473.

8) T. Inamura and H. Hosoda, “Crystallography of Martensite in TiAu Shape Memory Alloy”, Metall. Trans. 42A, (2011) 111-120.

9) M. Okuno, T. Inamura, H. Kanetaka and H. Hosoda, “Compression Behavior and Texture Development of Polymer Matrix Composites Based on NiMnGa Ferromagnetic Shape Memory Alloy Particles”, Materials Science Forum, 654-656 (2010) 2103-2106.

10) Y. Kusano, T. Inamura, H. Kanetaka, S. Miyazaki and H. Hosoda, “Phase

Constitution and Mechanical Properties of Ti-(Cr, Mn)-Sn Biomedical Alloys", Materials Science Forum, 654-656 (2010) 2118-2121.

11) Y. Shinohara, T. .Ishigaki, T. Inamura, H. Kanetaka, H. Hosoda, "Phase Constituents of Ti-Cr-Au and Ti-Cr-Au-Zr Alloy Systems", Materials Science Forum, 654-656 (2010) 2122-2125.

12) Y. Nakahira, T. Inamura, H. Kanetaka, S. Miyazaki and H. Hosoda, "Effect of Nitrogen Addition on Mechanical Property of Ti-Cr-Sn Alloy", Materials Science Forum, 654-656 (2010) 2126-2129.

13) H. Hosoda, M. Taniguchi, T. Inamura, H. Kanetaka and S. Miyazaki, "Effect of Aging on Mechanical Properties of Ti-Mo-Al Biomedical Shape Memory Alloy", Materials Science Forum, 654-656 (2010) 2150-2153.

14) T. Inamura, H. Hosoda, H. Kanetaka, H. Y. Kim and S. Miyazaki, "Self-Accommodation Morphology in Ti-Nb-Al Shape Memory Alloy", Materials Science Forum, 654-656 (2010) 2154-2157.

3. **Books**

1) H. Hosoda, "Chapter 5.5 Shape Memory/Superelastic Alloys", in *Process and microstructures of Metallic Materials*, eds. M. Morinaga, T. Furuhara and Y. Toda, Kyoritsu Press, (2010) pp.166-172. (in Japanese)
2) H. Hosoda, "Shape Memory and Superelastic Alloys", in *Introduction to Medical Metallic Materials*, Japan Institute of Metals, (2010) pp.106-117. (in Japanese)

4. **Invited Talks and Keynote Lectures**

1) H. Hosoda, "Development of Biomedical Shape Memory Alloys", The 5th International Workshop on Nano, Bio and Amorphous Materials", hosted by Tohoku Univ., Sansa-Tei, Tohgatta, Miyagi, Japan, Aug. 9-10, 2010 (Keynote Lecture)
2) H. Hosoda and T. Inamura, "Effect of Additional Elements on Ti-Cr based Alloys", Joint Research Workshop, Institute of Materials Research, Tohoku University, and Tohoku Branch Meeting, Japan Biomedical Society, Tohoku University, Sendai, Japan, August 30-31, 2010 (Invited talk)
3) S. Hirosawa, J. Kamibeppu, M. Iqbal, H. Hosoda and T. Sato, "Effect of Ultrasonic Treatment on Age-Hardening Response in an Al-Mg-Si Alloy", Proc. 12th Intl. Conf. on Aluminum Alloys, Sept. 5-9, 2010, Yokohama, Japan, JILM, (2010) 1938-1943. (with referee)
4) H. Hosoda, T. Inamura, T. Shimoyamada, H. Noma and K. Wakashima, "Phase Reactions of Al-Ti-B Ternary and Al-Ti-B-O Quaternary Systems for Al-based Metal Matrix Composites", Proc. 12th Intl. Conf. on Aluminum Alloys, Sept. 5-9, 2010, Yokohama, Japan, JILM, (2010) 2051-2056. (with referee)
5) H. Hosoda, "Development of High X-ray Radiographic Shape Memory Alloys", New Development of Shape Memory Alloy for Advanced Functional and Bio-Materials, SMA Symposium 2010, Association of Shape Memory Alloy, Yokohama, Japan, Nov. 26, 2010 (Keynote Lecture)
6) H. Hosoda, "Effect of Additional Elements on Shape Memory Properties of NI-free Titanium Based Biomedical Alloys", 3rd Conference on Functional Titanium Alloys, Japan Institute of Metals, Kansai Univ. Dec. 17, 2010 (Invited Talk)

Besides, 12 presentations such as Annual Meetings of Japan Institute of Metals

5. **Award**

1) Y. Watanabe, M. Okuno, T. Inamura, H. Hosoda, Y. Shimizu and H. Kanetaka, The Japan Institute of Metals Best Poster Award, JIM 2010 Fall Meeting, ”Reorientation Behavior of Martensite Variants by Magnetic Field in NiMnGa/Silicone/Polystyrene Composites”