



ELSEVIER

Journal of Nuclear Materials 318 (2003) ix–x

**journal of
nuclear
materials**

www.elsevier.com/locate/jnucmat

Contents

Proceedings of the 5th International Workshop on Spallation Materials Technology (IWSMT-5)

Foreword	vii
Contents	ix

Spallation facilities and R&D programs

Overview of the Spallation Neutron Source (SNS) with emphasis on target systems, <i>T.A. Gabriel, J.R. Haines and T.J. McManamy</i>	1
---	---

Materials research and development for the Spallation Neutron Source mercury target, <i>L.K. Mansur</i>	14
---	----

Materials related R&D work for the ESS target stations, <i>G.S. Bauer and H. Ullmaier</i>	26
---	----

R&D of a MW-class solid-target for a spallation neutron source, <i>M. Kawai, M. Furusaka, K. Kikuchi, H. Kurishita, R. Watanabe, J.-F. Li, K. Sugimoto, T. Yamamura, Y. Hiraoka, K. Abe, A. Hasegawa, M. Yoshiie, H. Takenaka, K. Mishima, Y. Kyanagi, T. Tanabe, N. Yoshida and T. Igarashi</i>	38
--	----

Summary of the results from post-irradiation examination of spent targets at the FZ-Juelich, <i>J. Chen, G.S. Bauer, T. Broome, F. Carsughi, Y. Dai, S.A. Maloy, M. Roedig, W.F. Sommer and H. Ullmaier</i>	56
---	----

LiSoR, a liquid metal loop for material investigation under irradiation, <i>T. Kirchner, Y. Bortoli, A. Cadiou, Y. Foucher, J.S. Stutzmann, T. Auger, Y. Dai, S. Dementjev, K. Geissmann, H. Glasbrenner, F. Gröschel, F. Heinrich, K. Kohlik, G. von Holzen, Ch. Perret and D. Viol</i>	70
--	----

Cavitation erosion and fatigue

R & D on mercury target pitting issue, <i>K. Kikuchi, H. Kogawa, M. Futakawa, S. Ishikura, M. Kaminaga and R. Hino</i>	84
--	----

SNS target tests at the LANSCE-WNR in 2001 – Part I, <i>B.W. Riemer, J.R. Haines, J.D. Hunn, D.C. Louston, T.J. McManamy and C.C. Tsai</i>	92
--	----

SNS target tests at the LANSCE-WNR in 2001 – Part II, <i>J.D. Hunn, B.W. Riemer and C.C. Tsai</i>	102
---	-----

Experimental observation of proton-induced shocks in free surface liquid metal targets, <i>A. Fabich, M. Beneditk and J. Lettry</i>	109
---	-----

Bubble dynamics in the thermal shock problem of the liquid metal target, <i>S. Ishikura, H. Kogawa, M. Futakawa, K. Kikuchi, R. Hino and C. Arakawa</i>	113
Preliminary evaluation of cavitation resistance of type 316LN stainless steel in mercury using a vibratory horn, <i>S.J. Pawel and E.T. Manneschmidt</i>	122
High strain fatigue properties of F82H ferritic-martensitic steel under proton irradiation, <i>P. Marmy and B.M. Oliver</i>	132
Influence of PbBi environment on the low-cycle fatigue behavior of SNS target container materials, <i>D. Kalkhoff and M. Grosse</i>	143
The effect of mean stress on the fatigue behavior of 316 LN stainless steel in air and mercury, <i>J.P. Strizak and L.K. Mansur</i>	151
Effects of mercury on fatigue behavior of Type 316 LN stainless steel: application in the Spallation Neutron Source, <i>H. Tian, P.K. Liaw, J.P. Strizak and L.K. Mansur</i>	157
Radiation effects: spallation	
Neutronics calculation, dosimetry analysis and gas measurements of the first SINQ target irradiation experiment, STIP-I, <i>Y. Dai, Y. Foucher, M.R. James and B.M. Oliver</i>	167
Radiation damage at the aluminum entrance window of the SINQ Target 3, <i>W. Lu, M.S. Wechsler and Y. Dai</i>	176
Characterization of lead-bismuth eutectic target material for accelerator driven transmutes, <i>Y. Gohar</i>	185
Mechanical properties of modified 9Cr-1Mo (T91) irradiated at $\leq 300^{\circ}\text{C}$ in SINQ Target-3, <i>Y. Dai, X.J. Jia and K. Farrell</i>	192
High temperature tensile testing of modified 9Cr-1Mo after irradiation with high energy protons, <i>M.B. Toloczko, M.L. Hamilton and S.A. Maloy</i>	200
Microstructure in martensitic steels T91 and F82H after irradiation in SINQ Target-3, <i>X. Jia and Y. Dai</i>	207
Tensile properties of 9Cr-1Mo martensitic steel irradiated with high energy protons and neutrons, <i>J. Henry, X. Avery, Y. Dai, P. Lamagnière, J.P. Pizzanelli, J.J. Espinas and P. Wident</i>	215

Radiation effects: other conditions

- Low temperature tensile properties of steels containing high concentrations of helium, *H. Ullmaier and J. Chen*
228
- The effect of cascade induced gas resolution on bubble formation in metals, *H. Trinkaus*
234
- Effect of implanted helium on tensile properties and hardness of 9% Cr martensitic stainless steels, *P. Jung, J. Henry, J. Chen and J.-C. Brachet*
241
- Microstructural analysis of 9% Cr martensitic steels containing 0.5 at.% helium, *J. Henry, M.-H. Mathon and P. Jung*
249
- Structural materials for fusion and spallation sources, *G.A. Cottrell and L.J. Baker*
260
- Swelling behavior of F82H steel irradiated by triple/dual ion beams, *E. Wakai, K. Kikuchi, S. Yamamoto, T. Aruga, M. Ando, H. Tanigawa, T. Taguchi, T. Sawai, K. Oka and S. Ohnuki*
267
- Tensile properties of ferritic/martensitic steels irradiated in HFIR, and comparison with spallation irradiation data, *K. Farrell and T.S. Byun*
274
- Comparison of fission neutron and proton/spallation neutron irradiation effects on the tensile behavior of type 316 and 304 stainless steel, *S.A. Maloy, M.R. James, W.R. Johnson, T.S. Byun, K. Farrell and M.B. Toloczko*
283
- Tensile properties of Inconel 718 after low temperature neutron irradiation, *T.S. Byun and K. Farrell*
292
- Microstructural analysis of ion-irradiation-induced hardening in Inconel 718, *N. Hashimoto, J.D. Hunn, T.S. Byun and L.K. Mansur*
300
- 2.5 MeV electron irradiation effect of alumina ceramics, *M. Kinsho, Y. Saito, D. Nishizawa and S. Michizono*
307

Corrosion and liquid metal embrittlement

- Influence of mercury velocity on compatibility with type 316L/316LN stainless steel in a flow loop, *S.J. Pawel, R.P. Talevarkhan, D.K. Felde and E.T. Manneschmidt*
313
- Corrosion behaviour of steels and refractory metals and tensile features of steels exposed to flowing PbBi in the LECOR loop, *C. Fazio, I. Ricapito, G. Scaddozzo and G. Benamati*
325
- Tensile tests on MANET II steel in circulating Pb–Bi eutectic, *H. Glasbrenner, F. Gröschel and T. Kirchner*
333
- Synergy effect of LBE and hydrogenated helium on resistance to LME of T91 steel grade, *S. Guerin, J.-L. Pastol, C. Leroux and D. Gorse*
339
- Corrosion–erosion test of SS316 in flowing Pb–Bi, *K. Kikuchi, Y. Kurata, S. Saito, M. Futakawa, T. Sasa, H. Oigawa, E. Wakai and K. Miura*
348
- Corrosion of type 6061-T6 aluminum in mercury and mercury vapor, *S.J. Pawel and E.T. Manneschmidt*
355
- Discussion summaries**
- Discussion session summary: cavitation erosion, *G.S. Bauer*
365
- Discussion session summary: corrosion, *J.R. DiStefano*
368
- Discussion session summary: radiation effects, *S.A. Maloy*
369
- Summary of third workshop on materials science and technology for the spallation neutron source at KEK, March 2002, *M. Kawai*
371
- Author index
379
- Subject index
382