

CONTENTS

Preface	ix
Hydrogen Recycling Studies in Tokamaks and Other Facilities	
1. Hydrogen Isotopes Retention in Fusion Reactor Plasma-facing Materials: An Abbreviated Review R.A. Causey, T.J. Venhaus	1
2. Trapping Effect in Hydrogen Retention in Metals O.V. Ogorodnikova	7
3. Recent Progress in Tritium Codeposition Modeling J.N. Brooks	17
4. The Effect of Deuterium Ion Bombardment on the Optical Properties of Beryllium Mirrors L.A. Jacobson, A.V. Babun, V.N. Bondarenko, G. Konovalov, I.I. Papirov, I.V. Ryzhkov, A.N. Shapoval, A.F. Shtan', S.I. Solodovchenko, A.A. Vasil'ev, V.S. Voitsenya, A.F. Bardamid, A.I. Belyayeva, A.A. Galuza	27
5. Hot Liner Divertor Concept Analysis of Dust Formation and Locations V.M. Kozhevnikov	35
Hydrogen Sputtering, Retention, Codeposition in Graphite	
6. Hydrogen Isotope Retention Analysis for Tokamak Plasma-facing Materials T.A. Burtseva	47
7. Surface Microrelief Influence on Hydrogen Interaction with Materials A.V. Golubeva, A.A. Evanov, N.N. Koborov, V.A. Kurnaev, S.S. Levchuk, and N.N. Trifonov	57

Hydrogen Recycling in Liquid Metals

- | | |
|---|----|
| 8. Deuterium Treatment Effects on Lithium and TiN-Lithium Sputtering in Solid and Liquid Phase
J.P. Allain, D.N. Ruzic | 73 |
| 9. Helium Entrapment in Liquid Metal Plasma-facing Surfaces in Tokamak Fusion Reactors
A. Hassanein | 83 |

Fundamental Permeation Studies I

- | | |
|--|-----|
| 10. A Model for the Steady State Plasma- and Gas-driven Hydrogen Isotope Permeation through Multi-layer Metal
O.V. Ogorodnikova | 95 |
| 11. Effect of Hydrogen Sorption on Surface Morphology of Pyrolytic Graphite
E.A. Denisov, T.N. Kompaniets, I.V. Makarenko,
Z. Waqar, A.N. Titkov | 105 |

Fundamental Permeation Studies II

- | | |
|--|-----|
| 12. General Model of Hydrogen Transport through Solid Membranes
K. Habib, A. Habib | 115 |
| 13. Influence of Hydrogen and Helium on Radiation Damage of Structural Materials
B.A. Kalin, A.N. Kalashnikov, A.G. Zaluzhnyi, I.I. Chernov | 125 |

Hydrogen Recycling in Tungsten, Niobium, and Nickel

- | | |
|--|-----|
| 14. Deuterium Retention in Tungsten and Tungsten Carbides Irradiated with D Ions
V.Kh. Alimov, A.P. Zakharov, R.Kh. Zalavutdinov | 131 |
| 15. An Interpretation of the Retention of Low Energy Deuterium Ions in Tungsten
R.G. Macaulay-Newcombe, A.A. Haasz, M. Poon, J.W. Davis | 145 |

General Hydrogen and Helium Issues and Other Metals

- | | |
|---|-----|
| 16. Hydrogen Interaction with TiN Films
E.A. Denisov, I.E. Gabis, T.N. Kompaniets,
A.A. Kurdyumov, A.A. Yukhimchuk | 157 |
| 17. Bimetallic Diffusion Membranes:
Possible Use for Active Hydrogen Recycling Control
G.P. Glazunov, E.D. Volkov, A. Hassanein | 163 |
| 18. Surface Evolution of Nickel under He and H Ion Irradiation by means of Kelvin Probe
G.-N. Luo, K. Yamaguchi, T. Terai, M. Yamawaki | 177 |

Measurements and Control of Hydrogen Recycling I

- | | |
|--|-----|
| 19. Development of an Innovative Carbon-based Ceramic Material;
Application in High Temperature, Neutron and Hydrogen Environment
C.H. Wu | 189 |
| 20. Nonmonotone Temperature Dependence of Plasma Driven Permeation through Nb Membrane
A. Spitsyn, A. Skovoroda, V. Svishchov,
Yu. Pustovoit, V. Stolyarov | 199 |

Measurements and Control of Hydrogen Recycling II

- | | |
|---|-----|
| 21. Usage of Hydrogen-saturated Getter for Sputtering Protection of Construction Elements in Vacuum-plasma Installations
V.V. Bobkov, V.N. Borisko, V.V. Chebotarev, I.Ye. Garkusha,
G.P. Glazunov, Ye.V. Klochko, M.V. Lototsky, N.S. Poltavtsev,
Yu.F. Shmal'ko, R.I. Starovoitov, V.I. Tereshin | 205 |
| 22. Laser Induced Breakdown Spectroscopy Technique for In-situ Dust Detecting in a Next-step Tokamak
V.M. Kozhevnik, E.E. Mukhin, G.T. Razdobarin,
V.V. Semenov, S. Yu. Tolstyakov, G. Federici | 213 |

Authors

227