Dr. Shimon Zalkind **April 2014**

CURRICULUM VITAE

Name:	Shimon Zalkind
Date of birth:	February 6, 1962 (Israel)
Marital status:	Married & three children
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Education:

2004 **Ph.D.** Department of Materials Engineering, Ben-Gurion University of the Negev, Beer- Sheva, Israel.
Ph.D thesis: "Study of the interaction of Beryllium Surface with Various Gases and Electron Radiation".

1996 **M.Sc.** Department of Materials Engineering, Ben-Gurion University of the Negev, Beer- Sheva, Israel.

1989 **B.Sc.** Department of Materials Engineering, Ben-Gurion University of the Negev, Beer- Sheva, Israel.

Employment

1989 - 2006: Researcher, Dept. of materials, Nuclear Research Center-Negev.

2007-present: Researcher, Dept. of physics, Laboratory of surface analysis, Nuclear Research Center-Negev.

2002-2003: Sabbatical leave at Dept. of chemistry, Ben Gurion Univ., Beer Sheva, Israel. Research topic: The interaction of water vapor with beryllium surface", Host: Prof. Micha Polak.

2007-2008: A Sabbatical year at Rutgers Univ., the department of physics, laboratory for surface modification, Piscataway NJ. Research topic: Thermal and electron induced interaction of hydrocarbons with TiO2 surfaces", Host: Prof. Ted Madey.

Scientific Fields of Interest

1. Gas interaction with solid surfaces

The interaction of gases, mainly water vapor, oxygen and hydrogen with metals and oxides. Study of the influence of radiation damage on the reaction of gases with rare earth metals and oxides. The influence of electron radiation on gas reaction and oxidation.

2. Modification of metal surfaces by ion implantation and plasma treatment.

This field of interest involves the study of surface modification and passivation of metals using ion implantation for prevention of gases corrosion. The research involves the characterization of the implanted layers and microscopic and macroscopic investigation of the resultant corrosion behavior.

3. Correlation between mechanical properties and microstructure of materials.

Study of mechanical characterization of materials and correlation with fracture analysis. The influence of micro-structure on the mechanical behavior.

List of publications

1. J. Pelleg, **S. Zalkind**, L. Zevin, B.M. Ditchek, "Silicide Formation in the Co-Si System by Repid Thermal Annealing", Thin Solid Films 249 (1994) 126.
2. **S. Zalkind**, J. Pelleg, L. Zevin and B.M. Ditchek, "In Situ X-ray Diffraction measurments of Silicide Formation in the Co-Si System", Thin Solid Films 249 (1994)187.
3. **S. Zalkind**, R. Ashkenazy, S. Harush, D. Halperin, D. Moreno, E. Abramov and A. Venkert, "Stress Corrosion Cracking of U-0.1%Cr in Humid Helium Atmosphere", J. Nuclear Materials 209 (1994) 169.
4. **S. Zalkind**, G.D. Lempert and D. Moreno, "The Influence of Preferred Crystallographic Orientation on Blister Size Distribution in Helium Implanted Surfaces", Scripta Metallurgica et Materialia 31 (1994) 225.
5. A. Raveh, R. Arkush, **S. Zalkind** and M. Brill, "Passivation of Uranium Metal by RF Plasma Nitriding Against Gas Phase (H_2, H_2O) Corrosion", Surface and Coating Technology, 82 (1996) 38.
6. D. Moreno, R. Arkush, **S. Zalkind** and N. Shamir, "Physical Discontinuities in the Surface Microstracture of Uranium Alloys as Preferred Sites for Hydrogen Attack. J. Nuclear Materials, 230 (1996) 181.
7. R. Arkush, A. Venkert, M. Aizenshtein, **S. Zalkind**, D. Moreno, M. Brill, M.H. Mintz and N. Shamir, "Site Related Nucleation and Growth of Hydrides on Uranium Surfaces", J. Alloys and Compounds 244 (1996) 197.
8. **S. Zalkind**, M. Polak and N. Shamir, "The Adsorption of O_2 vs. H_2O on Polycrystalline Beryllium", Surface Science 385 (1997) 318.

9. **S. Zalkind**, M. Polak and N. Shamir, "Adsorption of Hydrogen on Clean and Oxidized Beryllium Studied by Direct Recoils Spectrometry", Applied Surface Science 115 (1997) 273.
10. **S. Zalkind** and D. Moreno, "Fracture Characterization of Welded Cu-Be Alloys", J. Materials Science Lett. 18 (1999) 849.
11. R. Arkush, M. Brill**, S. Zalkind**, M.H. Mintz, N. Shamir, "The Effect of N_2^+ and C^+ Implantation on Uranium Hydride Nucleation and Growth Kinetics", J. Alloys and Compounds 330-332 (2002) 472.
12. **S. Zalkind**, O. Sabag, I. Makover, S. Harush, "The Influence of Carbon on the Tensile Properties of U-0.1%Cr", J. Materials Science Lett. 21 (2002) 551.
13. R. Arkush, **S. Zalkind**, M.H. Mintz, N. Shamir, "The Role of the Diffuse Interface of Implanted Surface Layers in Preventing gas Corrosion – Implantation of N_2^+ asnd C^+ in Uranium", Colloids and Surfaces A 208 (2002) 167.
14. **S. Zalkind**, M. Polak, N. Shamir, "Oxidation of Ion Bombarded vs. Annealed Beryllium", Surface Science 513 (2002) 501.
15. S. Zalkind, M. Polak, N. Shamir, "Temperature Dependent Interaction of Water Vapor with Beryllium Surface", Surface Science 529 (2003) 189.
16. **S. Zalkind**, M. Polak, N. Shamir, "Effects of Preadsorbed Hydrogen on the Adsorption of O_2, CO, and H_2O on Beryllium", Surface Science 539 (2003) 81.
17. I. Halevy, S. Salhove, **S. Zalkind**, M. Brill and I. Yaar, "High Pressure Studies of β-UH_3 Crystallographic and Electronic Structure", J. Alloys and Compounds 370 (2004) 59.
18. **S. Zalkind**, M. Polak, N. Shamir, "Electron Stimulated Oxidation of Beryllium by Water Vapor and by Oxygen", Phys. Rev. B 71, (2005) 125413
19. **S. Zalkind**, M. Polak, N. Shamir, "The Initial Oxidation of Beryllium by Water Vapor", Israel Journal of Chemistry 45 (2005) 147.
20. N. Shamir, E. Tiferet, S. Zalkind and M.H. Mintz, " Interaction of Water Vapor with Polycrystalline Uranium Surfaces", Surface Science 600 (2006) 657
21. **S. Zalkind**, M. Polak, N. Shamir, "oxidation of beryllium by O_2 and H_2O at high temperatures (320-750K)"' Surface Science 610 (2007) 1326.

22. E. Tiferet, N. Shamir, **S. Zalkind**, I. Jacob, M.H. Mintz, "Interaction of water vapor with polycrystalline uranium surfaces - the low temperature regime", Surface Science 601 (2007) 936.
23. E. Tiferet, M.H. Mintz, **S. Zalkind**, I. Jacob, N. Shamir, "Heat treatment effects on the surface chemisorption behavior of strained uranium: the H_2O/U reaction", J. Alloys and compounds 444-445 (2007) 177.
24. E. Tiferet, M.H. Mintz, **S. Zalkind**, N. Shamir, "The interaction of water vapor and hydrogen -water mixture with polycrystalline uranium surfce", Annales 22 (2008) 271.
25. Y. Rosenthal, O. Sabag, A. Tourgeman, **S. Zalkind**, A. Stern, N. Kedem and D. Eliezer, "Solderability testing of lead-free solder joints using miniature specimens", J. of Testing and evaluation 36 (2008) 417
26. B.V. Yakshinskiy, M.N. Hadhili, **S. Zalkind**, M. Chandhok and T.E. Madey, "Radiation induced defect formation and reactivity of TiO_2 capping layers with MMA: a comparison with Ru", Proc. SPIE, vol 6921, 692114 (2008).
27. **S. Zalkind**, B.V. Yakshinskiy and T.E. Madey, "Interaction of benzene with TiO_2 surfaces: relevance to contamination of extreme ultraviolet lithography mirror capping layers", J. Vac. Sci. Technol. B 26(6) (2008), 2241
28. B.V. Yakshinskiy, **S. Zalkind**, R.A. Bartynski, R. Caudillo and T.E. Madey, "Carbon film growth on model electron-irradiated MLM cap layer: Interaction of benzene and MMA vapor with TiO_2", Proc. SPIE, vol 7271, 727110 (2009)
29. B.V. Yakshinskiy, **S. Zalkind**, R.A. Bartynski, and R. Caudillo, "Electron induced interaction of selected hydrocarbons with TiO_2 surfaces: The relevance to extreme ultraviolet lithography", J. Phys: Condensed Matter 22 (2010) 084004.
30. G. Benamar, D. Schweke, N. Shamir, **S. Zalkind**, T. Livneh, A. Danon, G. Kimmel, M.H. Mintz, "Heat pretreatment-induced activation of gadolinium surfaces towards the initial precipitation of hydrides", J. Alloys and compounds 498 (2010) 26.
31. N. Shamir, D. Schweke, A. Rubin, T. Livneh and **S. Zalkind**, "Carbon enhanced hydrogen attack on oxidized U-0.1% Cr surface", Materials Science and Engineering 9 (2010) 012037.
32. **S. Zalkind**, M. Nahmani and N. Shamir, "The interaction of O_2 and H_2O with the surface of Zr_2Fe at the temperature range 300-773^{o}K", J. Alloys and Compounds, 501 (2010) 221.

33. S. Cohen, N. Shamir, M.H. Mintz, I. Jacob and **S. Zalkind**, "The interaction of O_2 with the surface of polycrystalline gadolinium at temperature range 300-670K", Surface Science 605 (2011) 1586.
34. I. Halevy, A. Hen, A. Broide, M.L. Winterrose, **S. Zalkind**, Z. Chen, "High-Pressure irreversible amorphization of $La_{1/3}NbO_3$", J. Modern Physics 2 (2011) 323.
35. S. Cohen, A. Abramovich, **S. Zalkind**, M.H. Mintz, I. Jacob, R. Akhveldiani, M. Segev. A Hoffman and N. Shamir, "The interaction of H_2O with the surface of polycrystalline gadolinium at the temperature range 300-570K", Surface Science 617 (2013) 29.
36. **S. Zalkind**, N. Shamir, T. Gouder, R. Akhveldiani, A. Hoffman, "Amorphous carbon enhancement of hydrogen penetration into UO_2", Applied Surface Science 305 (2014) 539.
37. S. Cohen. M.H. Mintz, **S. Zalkind**, T. Gouder, N. Shamir, "Water chemisorption on a sputter deposited uranium dioxide film-Effect of defects", Solid State Ionics, 263 (2014) 39.