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**Study of Metal Dusting Phenomenon and Development
of Materials Resistant to Metal Dusting**

ANNUAL REPORT

For the Period January to December 2001

Prepared by

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Energy Technology Division

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CONTENTS

FIGURES	iv
TABLES	viii
ABSTRACT	1
PROJECT DESCRIPTION	1
OBJECTIVES	2
STEERING GROUP AND MTI PROJECT MEETINGS	2
APPROACH	3
PROJECT TASKS	4
BACKGROUND	4
Process Environments	4
Metal Dusting Mechanism	7
TECHNICAL PROGRESS	8
Gas Phase Reactions	8
Carbon Activity Calculations	9
EXPERIMENTAL PROGRAM	13
Equipment Description	13
Materials	17
Specimen Preparation	19
TEST RESULTS AND DISCUSSION	20
Key Variables for Carbon Deposition and Metal Dusting	20
Characteristics of Carbon Deposits	23
Proposed Metal Dusting Mechanism	33
Metal Dusting of Pure Metals	35
Behavior of Fe- and Ni-Base Alloys	42
DISCUSSION OF METAL DUSTING INITIATION	53
PERFORMANCE OF PACK-DIFFUSION COATINGS	61
PROJECT SUMMARY	66
ACKNOWLEDGMENTS	70
REFERENCES	70

FIGURES

1. Carbon activity curves calculated as a function of temperature for Gas Mixture 1.	10
2. Carbon activity curves calculated as a function of temperature for Gas Mixture 2.	11
3. Carbon activity curves calculated as a function of temperature for Gas Mixture 3.	11
4. Schematic diagram for three test facilities set up for metal dusting experiments.	14
5. Schematic diagram of furnace assembly and gas flow arrangement used for metal dusting experiments.	15
6. Schematic diagram of steam and gas flow scheme used for metal dusting experiments.	16
7. Schematic diagram of quartz specimen holder and test coupon arrangement used for metal dusting experiments.	17
8. Macrograph of specimens after 100-h exposure in Runs 2 and 3 conducted at 593°C.	22
9. Macrograph of specimens after 100-h exposure in Runs 4 and 5 conducted at 704°C.	22
10. Macrograph of specimens after 5-h exposure in Runs 6 and 7 conducted at 593°C.	23
11. Macrograph of specimens after 72-h exposure in Runs 8 and 9 conducted at 593°C.	24
12. Structure of graphite.	24
13. Raman spectra of carbon "soot" from Runs 4, 5, and 7 along with Raman spectra of polycrystalline graphite and pencil "lead".	26
14. XRD pattern of coke and surface layer on iron sample after exposure to Gas 4 at 593°C for 100 h.	27
15. Temperature dependence of magnetization of metal dusting product obtained in Run 4 at 593°C.	28
16. Peak widths of [002] diffraction from graphite and coke.	28
17. Peak widths of [002] diffraction from glassy carbon, graphite, and coke.	29
18. Raman spectra of graphite, glassy carbon, and coke made at 593°C and 704°C.	30

19. Raman spectra of coke made at 593°C and 704°C.	31
20. Raman spectra of coke, carbon on alloy sample surface, and carbon in sample defects.	32
21. SEM cross section of Fe-Al alloy after metal dusting experiment at 593°C.	32
22. Proposed process for carbon crystallization after deposition in metal-dusting environment.	34
23. Proposed process for catalytic crystallization.	34
24. Weight change data for pure Fe specimens exposed in Runs 1 through 7.	36
25. Post test SEM photomicrograph of metallographic cross section of iron.	37
26. Schematic of metal dusting process in the degradation of Fe.	37
27. Raman spectra for carbon adhered to Ni specimens from Runs 3-7.	39
28. SEM photomicrographs of Ni surfaces before and after exposure in a metal dusting experiment.	39
29. SEM photomicrograph of cross section of Ni after testing.	40
30. Typical XRD pattern of the product of metal dusting experiment involving Ni.	40
31. XRD [002] diffraction peaks for graphite, coke, and carbon on the surface of Ni.	41
32. XRD [002] diffraction peaks for carbon black and coke.	41
33. XRD [002] diffraction peaks of glassy carbon with and without 10% Ni.	42
34. Macrophotographs of Fe-base alloy specimens after 1000-h exposure at 593°C in Run 15 in Gas 2 with 23.1 vol.% H ₂ O and Run 19 in Gas 2 with 2 vol.% H ₂ O.	43
35. SEM photomicrographs of surfaces of T91, 803, APMT, and 153MA after 1000-h exposure in Run 15.	44
36. SEM photomicrographs of surfaces of Alloy 800, 310 ss, 321 ss, and MA956 after 1000-h exposure in Run 15.	45
37. SEM photomicrographs of surfaces of 253MA, 321L, 4C54, and 38815 after 1000-h exposure in Run 15.	45
38. Higher magnification SEM photomicrographs of surfaces of MA956, 38815, 253MA, and APMT after 1000-h exposure in Run 15.	46
39. SEM photomicrographs of surfaces of 600, 601, 690, and 617 after 1000-h exposure in Run 16.	46
40. SEM photomicrographs of surfaces of 602CA, 214, 230, and 45TM after 1000-h exposure in Run 16.	47

41. SEM photomicrographs of cross sections of T91, 800, and 321 after 1000-h exposure in Run 15.	48
42. SEM photomicrographs of cross sections of 600, 690, 602CA, and 45TM after 1000-h exposure in Run 16.	48
43. Raman spectra for carbon adhered to several alloys with different Cr contents after 1000-h exposure in a metal dusting environment in Run 15 at 593°C.	49
44. Raman spectra for surfaces of several Fe-base alloys with different Cr contents after 1000-h exposure in a metal dusting environment in Run 15 at 593°C.	50
45. Raman spectra for surfaces of several Ni-base alloys with different Cr contents after 1000-h exposure in a metal dusting environment in Run 16 at 593°C.	50
46. Raman spectra for surfaces of several 300-series stainless steel alloys and Alloy 800 after 1000-h exposure in a metal dusting environment at 593°C.	51
47. Raman spectra for surfaces of several 300-series stainless steel alloys and Alloy 800 after 1000-h exposure in a metal dusting environment at 593°C.	52
48. Raman spectra for surfaces of several Al-containing alloys after 1000-h exposure in a metal dusting environment at 593°C.	54
49. 593°C Raman spectra for surfaces of several Al-containing alloys after 1000-h exposure in a metal dusting environment at 593°C.	55
50. Raman spectra for surfaces of several Si-containing alloys after 1000-h exposure in a metal dusting environment at 593°C.	56
51. Comparison of Raman spectra for surfaces of several Si-containing alloys after 1000-h exposure in a metal dusting environment at 593°C.	57
52. Oxygen/carbon thermochemical diagrams for Fe, Cr, and Ni calculated for 593°C.	60
53. SEM photomicrograph of cross section of alonized T22 steel and EDX elemental depth profiles of Al and Fe for the specimen in the as-coated condition.	63
54. SEM photomicrograph of cross section of alonized 321 stainless steel and EDX elemental depth profiles of Al, Fe, Cr, and Ni for the specimen in the as-coated condition.	63
55. SEM photomicrograph of cross section of alonized Alloy 800 and EDX elemental depth profiles of Al, Fe, Cr, and Ni for the specimen in the as-coated condition.	64

56. SEM photomicrograph of cross section of ChromePlexed T22 steel and EDX elemental depth profiles of Si, Fe, and Cr for the specimen in the as-coated condition. 64
57. SEM photomicrograph of cross section of ChromePlexed 321 stainless steel and EDX elemental depth profiles of Si, Fe, Cr, and Ni for the specimen in the as-coated condition. 65
58. SEM photomicrograph of cross section of ChromePlexed Alloy 800 and EDX elemental depth profiles of Si, Fe, Cr, and Ni for the specimen in the as-coated condition. 65
59. SEM photomicrograph of surface of alonized T22 steel after oxidation at 900°C in air and after oxidation at 900°C followed by metal dusting exposure for 142 h at 593°C. 66
60. SEM photomicrograph of surface of alonized 321 stainless steel after oxidation at 900°C in air and after oxidation at 900°C followed by metal dusting exposure for 142 h at 593°C. 67
61. SEM photomicrograph of surface of alonized Alloy 800 after oxidation at 900°C in air and after oxidation at 900°C followed by metal dusting exposure for 142 h at 593°C. 67
62. SEM photomicrograph of surface of ChromePlexed T22 steel after oxidation at 900°C in air and after oxidation at 900°C followed by metal dusting exposure for 142 h at 593°C. 68
63. SEM photomicrograph of surface of ChromePlexed 321 stainless steel after oxidation at 900°C in air and after oxidation at 900°C followed by metal dusting exposure for 142 h at 593°C. 68
64. SEM photomicrograph of surface of ChromePlexed Alloy 800 after oxidation at 900°C in air and after oxidation at 900°C followed by metal dusting exposure for 142 h at 593°C. 69

TABLES

1. Chemical compositions of gas mixtures relevant for metal dusting study.	9
2. Carbon activity values at 593 and 704°C based on reactions 1, 2, and equilibrium.	10
3. Nominal chemical compositions of alloys selected for the experimental program.	18
4. Experimental conditions for laboratory runs.	21
5. Crystallite dimension and interlayer plane distance of graphite, coke, and glassy carbon.	29
6. Gas chemistries used in metal dusting research.	58
7. Carbon activity and oxygen partial pressure values at 593°C for gas mixtures used by various researchers.	59

ABSTRACT

The deposition of carbon from carbonaceous gaseous environments is prevalent in many chemical and petrochemical processes such as reforming systems, syngas production systems, iron reduction plants, and others. One of the major consequences of carbon deposition is the degradation of structural materials by a phenomenon known as "metal dusting." There are two major issues of importance in metal dusting. First is formation of carbon and subsequent deposition of carbon on metallic materials. Second is the initiation of metal dusting degradation of the alloy. Details are presented on a research program that is underway at Argonne National Laboratory to study the metal dusting phenomenon from a fundamental scientific base involving laboratory research in simulated process conditions and field testing of materials in actual process environments. The project has participation from the U.S. chemical industry, alloy manufacturers, and the Materials Technology Institute, which serves the chemical process industry.

PROJECT DESCRIPTION

Project Title: Study of Metal Dusting Phenomenon and Development of Materials Resistant to Metal Dusting

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