

Acknowledgments

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References

1. N. Ueda, T. Kobayashi, E. Suito, Y. Harada, and M. Watanabe, in *Proc. 7th Int. Cong. E.M.*, vol. 1, edited by P. Favard (Société Française de Microscopie Electronique, Paris, 1970) p. 23.
2. J.M. Cowley and S. Iijima, *Z. Naturforsch* **27** (1972) p. 445.
3. H. Hashimoto, Y. Yokota, T. Takai, H. Endo, and A. Kumao, *Chem. Scripta* **14** (1979) p. 125.
4. S. Iijima and S. Ichihashi, *Jpn. J. Appl. Phys.* **24** (1985) p. L126.
5. J.O. Bovin, L.R. Wallenberg, and D.J. Smith, *Nature* **317** (1985) p. 47.
6. N. Tanaka, H. Kimata, and T. Kizuka, *J. Electron Microsc.* **45** (1996) p. 113.
7. G. Ayrault and G. Ehrlich, *Phys. Rev. Lett.* **31** (1973) p. 1407.
8. E. Ganz, S.K. Theiss, I-S. Hwang, and J. Golovchenko, *ibid.* **68** (1992) p. 1567.
9. Y.M. Mo, *ibid.* **71** (1993) p. 2423.
10. D.W. Pohl and R. Moller, *Rev. Sci. Instrum.*

- 59 (1988) p. 840.
11. T. Kizuka and N. Tanaka, *Philos. Mag. Lett.* **69** (1994) p. 135.
12. N. Tanaka, H. Kimata, and T. Kizuka, *Surf. Rev. Lett.* **3** (1996) p. 955.
13. N. Tanaka, T. Kizuka, M. Naruse, and T. Yanagisawa, in *Proc. 13th Int. Cong. E.M.*, vol. 2A, edited by B. Jouffrey (Les Editions de Physique Les Ulis, Paris, 1994) p. 381.
14. K. Kimoto, N. Tanaka, and K. Mihama, *J. Electron Microsc.* **38** (1989) p. 165.
15. N. Tanaka, M. Nagao, and K. Mihama, *Ultramicroscopy* **25** (1988) p. 241.
16. T.J. Konno and B. Sinclair, *Philos. Mag.* **B71** (1995) p. 179.
17. A. Sugawara, T. Kikukawa, and O. Nittono, *Mater. Sci. Eng.* **A179/180** (1994) p. 355.
18. B. Bian, T. Ohkubo, and Y. Hirotsu, *J. Electron Microsc.* **44** (1995) p. 182.
19. T.A. Witten and L.M. Sander, *Phys. Rev. Lett.* **47** (1981) p. 1400.
20. P. Buffat and J. Borel, *Phys. Rev. A* **13** (1976) p. 2287.
21. N. Tanaka, M. Kawahara, and T. Kizuka, in *Proc. Annual Meeting, Phys. Soc. Jpn.*, vol. 2 (Buturi-Gakkai, Tokyo, October 1996) p. 650.
22. "Grain Boundary Structure and Its Related Phenomena," edited by S. Karashima, supplement to *Trans. J.I.M.* **27** (1986).
23. T. Kizuka and N. Tanaka, *Mater. Sci. Forum* **233/234** (1997) p. 405.
24. D.M. Duffy and P.W. Tasker, *Philos. Mag.* **A47** (1983) p. 817.
25. T.R. Albrecht, S. Akamine, T.E. Carver, and C.F. Quate, *J. Vac. Sci. Technol. A* **8** (1990) p. 3386.
26. D.M. Eigler and E.K. Schweizer, *Nature* **344** (1990) p. 524.
27. M.E. Mochel, C.J. Humphreys, J.A. Eades, J.M. Mochel, and A.M. Petford, *Appl. Phys. Lett.* **42** (1983) p. 392.
28. T. Kizuka and N. Tanaka, *Philos. Mag.* **A71** (1995) p. 631.
29. *Ibid.*, in *Proc. 54th Annual Meeting of MSA*, edited by G.W. Bailey (San Francisco Press, San Francisco, 1996) p. 980.
30. C.M. Mate, G.M. MacClelland, R. Erlandsson, and S. Chiang, *Phys. Rev. Lett.* **59** (1987) p. 1942.
31. T. Kizuka, K. Yamada, S. Deguchi, M. Naruse, and N. Tanaka, *Phys. Rev. B* **55** (1997) p. R7398.
32. *Ibid.*, *J. Electron Microsc.* **46** (2) (1997) p. 151.
33. For example, see T. Kamino and H. Saka, *Microanal. Microstruc.* **4** (1993) p. 127.
34. For example, see L.D. Marks, M. Kubozoe, M. Tomita, M. Ukiana, T. Furutsu, and I. Matsui, *Proc. 46th E.M.S.A. Meeting* (1988) p. 658.
35. P.E. Mooney, G.Y. Fan, C.E. Meyer, K.V. Truong, D.B. Bui, and O. Krivanek, in *Proc. 12th Int. Cong., E.M.*, vol. 1 (San Francisco Press, San Francisco, 1990) p. 164.
36. N. Mori, T. Oikawa, T. Katoh, J. Miyahara, and Y. Harada, *Ultramicroscopy* **25** (1988) p. 195.
37. A. Tonomura, L.H. Allard, G. Pozzi, D.C. Joy, and Y.A. Ono, eds., *Electron Holography* (North Holland, Amsterdam, 1995).
38. T. Kizuka and N. Tanaka, in *Proc. 13th Cong., E.M.*, vol. 2A, edited by B. Jouffrey (Les Editions de Physique Les Ulis, Paris, 1994) p. 369.
39. *Ibid.*, *Surf. Rev. Lett.* **3** (1996) p. 1187.
40. *Ibid.*, in *Proc. 54th Annual Meeting of MSA*, edited by G.W. Bailey (San Francisco Press, San Francisco, 1996) p. 692.
41. *Ibid.*, *Surf. Sci.* (1997) in print. □

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