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Modeling the optical constants of $\text{Hg}_x\text{Cd}_{1-x}\text{Te}$ alloys in the 1.5–6.0 eV range

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The optical constants of $\text{Hg}_x\text{Cd}_{1-x}\text{Te}$ as a function of energy and composition x are modeled over a wide spectral range from 1.5 to 6 eV. The model employed represents an extension of Adachi's model and incorporates the adjustable broadening function rather than the conventional Lorentzian one. In this way, greater flexibility of the model is achieved, enabling us to obtain an excellent agreement with the experimental data. The relative rms errors obtained for all compositions are below 2.5% for the real part and below 6% for the imaginary part of the index of refraction. The lowest rms errors are obtained for $x = 0$ (0.6% for the real part and 0.7% for the imaginary part of the index of refraction), and the highest for the $x = 0.91$ (2.4% for the real part and 5.8% for the imaginary part). © 1999 American Institute of Physics.

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ERRATUM

1. Erratum: "Modeling the optical constants of $\text{Hg}_x\text{Cd}_{1-x}\text{Te}$ alloys in the 1.5–6.0 eV range" [J. Appl. Phys. **85**, 2854 (1999)] Aleksandra B. Djurišić *et al.* J. Appl. Phys. **86**, 4713 (1999)

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References

- L. Viña, C. Umbach, M. Cardona, and L. Vodopyanov, Phys. Rev. B **29**, 6752 (1984).
- M. Cardona, J. Appl. Phys. **32**, 2151 (1961).
- M. D. Blue, Phys. Rev. **134**, A226 (1964).
- D. T. F. Marple and H. Ehrenreich, Phys. Rev. Lett. **8**, 87 (1962).
- K. Liu, J. H. Chu, and D. Y. Tang, J. Appl. Phys. **75**, 4176 (1994).
- J. H. Chu, Z. Y. Mi, and D. Y. Tang, J. Appl. Phys. **71**, 3955 (1992).
- D. T. F. Marple, Phys. Rev. **150**, 728 (1966).
- J. H. Chu, B. Li, K. Liu, and D. Y. Tang, J. Appl. Phys. **75**, 1234 (1994).
- E. Finkman and S. E. Schacham, J. Appl. Phys. **56**, 2896 (1984).



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- E. Finkman and Y. Nemirovsky, *J. Appl. Phys.* **50**, 4356 (1979).
- V. Nathan, *J. Appl. Phys.* **83**, 2812 (1998).
- J. L. Schmit, *J. Appl. Phys.* **41**, 2876 (1970).
- C. C. Kim and S. Sivanathan, *J. Appl. Phys.* **78**, 4003 (1995).
- S. Adachi, *Phys. Rev. B* **38**, 12345 (1989).
- C. C. Kim, J. W. Garland, H. Abad, and P. M. Raccah, *Phys. Rev. B* **47**, 1876 (1993).
- F. L. Terry, Jr., *J. Appl. Phys.* **70**, 409 (1991).
- S. Adachi, *J. Appl. Phys.* **53**, 5863 (1982).
- S. Adachi, *J. Appl. Phys.* **58**, R1 (1985).
- S. Ozaki and S. Adachi, *J. Appl. Phys.* **78**, 3380 (1995).
- D. W. Jenkins, *J. Appl. Phys.* **68**, 1848 (1990).
- S. Adachi, T. Kimura, and N. Suzuki, *J. Appl. Phys.* **74**, 3435 (1993).
- R. J. Deri and M. A. Emanuel, *J. Appl. Phys.* **74**, 3435 (1993).
- Y. Kokubo and I. Ohto, *J. Appl. Phys.* **81**, 2042 (1997).
- J. Zheng, C.-H. Lin, and C. H. Kuo, *J. Appl. Phys.* **82**, 792 (1997).
- A. D. Rakić and M. L. Majewski, *J. Appl. Phys.* **80**, 5509 (1996).
- C. C. Kim, J. W. Garland, H. Abad, and P. M. Raccah, *Phys. Rev. B* **45**, 11749 (1992).
- G. L. Hansen, J. L. Schmit, and T. N. Casselman, *J. Appl. Phys.* **53**, 7099 (1982).
- A. D. Rakić, J. M. Elazar, and A. B. Djurić, *Phys. Rev. E* **52**, 6862 (1995).
- A. B. Djurić, A. D. Rakić, and J. M. Elazar, *Phys. Rev. E* **55**, 4797 (1997).

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