

DAFTAR PUSTAKA

- Ahmoum, H., Bougrara, M., Su'ait, M. S., Li, G., Chopra, S., Wang, Q., & Kerouad, M. (2020). Understanding the effect of the carbon on the photovoltaic properties of the Cu₂ZnSnS₄. *Materials Chemistry and Physics*. <https://doi.org/10.1016/j.matchemphys.2020.123065>
- Alharbi, F., Bass, J. D., Salhi, A., Alyamani, A., Kim, H. C., & Miller, R. D. (2011). Abundant non-toxic materials for thin film solar cells: Alternative to conventional materials. *Renewable Energy*. <https://doi.org/10.1016/j.renene.2011.03.010>
- Bercx, M., Saniz, R., Partoens, B., & Lamoen, D. (2018). Exceeding the shockley-queisser limit within the detailed balance framework. In *Many-body Approaches at Different Scales: A Tribute to Norman H. March on the Occasion of his 90th Birthday*. https://doi.org/10.1007/978-3-319-72374-7_15
- Bercx, Marnik, Sarmadian, N., Saniz, R., Partoens, B., & Lamoen, D. (2016). First-principles analysis of the spectroscopic limited maximum efficiency of photovoltaic *absorber* layers for CuAu-like chalcogenides and silicon. *Physical Chemistry Chemical Physics*. <https://doi.org/10.1039/c6cp03468c>
- Blöchl, P. E. (1994). Projector augmented-wave method. *Physical Review B*, 50(24), 17953–17979. <https://doi.org/10.1103/PhysRevB.50.17953>
- Born, M., & Oppenheimer, R. (1927). Zur Quantentheorie der Moleküle. *Annalen der Physik*, 389(20), 457–484. <https://doi.org/10.1002/andp.19273892002>

- Botti, S., Kammerlander, D., & Marques, M. A. L. (2011). Band structures of Cu₂ZnSnS₄ and Cu₂ZnSnSe₄ from many-body methods. *Applied Physics Letters*. <https://doi.org/10.1063/1.3600060>
- Ceperley, D. M., & Alder, B. J. (1980). Ground state of the electron gas by a stochastic method. *Physical Review Letters*, 45(7), 566–569. <https://doi.org/10.1103/PhysRevLett.45.566>
- Chen, S., Walsh, A., Gong, X. G., & Wei, S. H. (2013). Classification of lattice defects in the *kesterite* Cu₂ZnSnS₄ and Cu₂ZnSnSe₄ earth-abundant solar cell *absorbers*. *Advanced Materials*, 25(11), 1522–1539. <https://doi.org/10.1002/adma.201203146>
- Choubrac, L., Lafond, A., Guillot-Deudon, C., Moëlo, Y., & Jobic, S. (2012). Structure flexibility of the Cu₂ZnSnS₄ *absorber* in low-cost photovoltaic cells: From the stoichiometric to the copper-poor compounds. *Inorganic Chemistry*, 51(6), 3346–3348. <https://doi.org/10.1021/ic202569q>
- Drude, P. (1900). Zur Elektronentheorie der Metalle. *Annalen der Physik*. <https://doi.org/10.1002/andp.19003060312>
- Dudarev, S., & Botton, G. (1998). Electron-energy-loss spectra and the structural stability of nickel oxide: An LSDA+U study. *Physical Review B - Condensed Matter and Materials Physics*, 57(3), 1505–1509. <https://doi.org/10.1103/PhysRevB.57.1505>
- Engel, E., & Dreizler, R. M. (2011). *Density functional theory : an advanced course*. Springer.
- Ferdaous, M. T., Shahahmadi, S. A., Chelvanathan, P., Akhtaruzzaman, M., Alharbi, F. H., Sopian, K., Tiong, S. K., & Amin, N. (2019). Elucidating the role of interfacial MoS₂ layer in Cu₂ZnSnS₄ thin film solar cells by numerical analysis. *Solar Energy*.

Jessie Manopo, 2021

ANALISIS PENGARUH DEFEK Cu_{Zn}+Zn_{Cu} PADA KRISTAL Cu₂ZnSnS₄ SEBAGAI MATERIAL SEL SURYA MENGGUNAKAN TEORI FUNGSI KERAPATAN

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

<https://doi.org/10.1016/j.solener.2018.11.055>

Fermi, E. (1962). *Collected papers(Note e memorie)*. [Chicago].

<http://hdl.handle.net/2027/mdp.39015001321200>

Griffiths, D. J. (2017). Introduction to Electrodynamics. In *Introduction to Electrodynamics*. <https://doi.org/10.1017/9781108333511>

Haddout, A., Raidou, A., & Fahoume, M. (2019). A review on the numerical modeling of CdS/CZTS-based solar cells. In *Applied Physics A: Materials Science and Processing*. <https://doi.org/10.1007/s00339-019-2413-3>

Haddout, A., Raidou, A., Fahoume, M., Elharfaoui, N., & Lharch, M. (2019). Influence of CZTS layer parameters on cell performance of kesterite thin-film solar cells. *Lecture Notes in Electrical Engineering*.
https://doi.org/10.1007/978-981-13-1405-6_73

Han, D., Sun, Y. Y., Bang, J., Zhang, Y. Y., Sun, H. B., Li, X. Bin, & Zhang, S. B. (2013). Deep electron traps and origin of p-type conductivity in the earth-abundant solar-cell material Cu₂ZnSnS₄. *Physical Review B - Condensed Matter and Materials Physics*, 87(15), 155206.
<https://doi.org/10.1103/PhysRevB.87.155206>

Heyd, J., Scuseria, G. E., & Ernzerhof, M. (2003). Hybrid functionals based on a screened Coulomb potential. *Journal of Chemical Physics*, 118(18), 8207–8215. <https://doi.org/10.1063/1.1564060>

Hohenberg, P., & Kohn, W. (1964). Inhomogeneous electron gas. *Physical Review*, 136(3B), B864. <https://doi.org/10.1103/PhysRev.136.B864>

Huang, D., & Persson, C. (2013). Band gap change induced by defect complexes in Cu₂ZnSnS₄. *Thin Solid Films*, 535(1), 265–269.
<https://doi.org/10.1016/j.tsf.2012.10.030>

Jessie Manopo, 2021

ANALISIS PENGARUH DEFEK Cu_{Zn}+Zn_{Cu} PADA KRISTAL Cu₂ZnSnS₄ SEBAGAI MATERIAL SEL SURYA MENGGUNAKAN TEORI FUNGSI KERAPATAN

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

- Hubbard, J. (1963). Electron correlations in narrow energy bands. *Proceedings of the Royal Society of London. Series A. Mathematical and Physical Sciences*, 276(1365), 238–257. <https://doi.org/10.1098/rspa.1963.0204>
- Isyaku, A. O. (2019). *Structural, Electronic and Optical Properties of Cu₂Sns₃ Solar Absorber: A First-Principle Density Functional Theory Investigation.* <http://repository.aust.edu.ng/xmlui/handle/123456789/4937>
- Kahlaoui, S., Belhorma, B., Labrim, H., Boujnah, M., & Regragui, M. (2020). Strain effects on the electronic, optical and electrical properties of Cu₂ZnSnS₄: DFT study. *Heliyon*. <https://doi.org/10.1016/j.heliyon.2020.e03713>
- Kamoun, N., Bouzouita, H., & Rezig, B. (2007). Fabrication and characterization of Cu₂ZnSnS₄ thin films deposited by spray pyrolysis technique. *Thin Solid Films*. <https://doi.org/10.1016/j.tsf.2006.12.144>
- Kittel, C. (2004). Introduction to Solid State Physics, 8th edition. *Wiley & Sons, New York, NY*.
- Kohn, W., & Sham, L. J. (1965). Self-consistent equations including exchange and correlation effects. *Physical Review*, 140(4A), A1133. <https://doi.org/10.1103/PhysRev.140.A1133>
- Kumar, M., Kumar, M., & Persson, C. (2012). *Cu₂ZnSnS₄ and Cu₂ZnSnSe₄ as Potential Earth-Abundant Thin-Film Absorber Materials: A Density Functional Theory Study.* <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.689.3051>
- Kumar, M., & Persson, C. (2012). *Cu₂ZnSnS₄ and Cu₂ZnSnSe₄ as Potential Earth-Abundant Thin-Film Absorber Materials: A Density Functional Theory Study.* <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.689.3051&rep=rep1>
Jessie Manopo, 2021
ANALISIS PENGARUH DEFEK Cu_{Zn}+Zn_{Cu} PADA KRISTAL Cu₂ZnSnS₄ SEBAGAI MATERIAL SEL SURYA MENGGUNAKAN TEORI FUNGSI KERAPATAN

1&type=pdf

- Lewis, G. N. (1916). The atom and the molecule. *Journal of the American Chemical Society*, 38(4), 762–785. <https://doi.org/10.1021/ja02261a002>
- Lowe, J. P., & Peterson, K. A. (2006). *Quantum chemistry*. Elsevier Academic Press.
- M Ganose, A., J Jackson, A., & O Scanlon, D. (2018). sumo: Command-line tools for plotting and analysis of periodic ab initio calculations. *Journal of Open Source Software*, 3(28), 717. <https://doi.org/10.21105/joss.00717>
- Mitzi, D. B., Gunawan, O., Todorov, T. K., Wang, K., & Guha, S. (2011). The path towards a high-performance solution-processed kesterite solar cell. *Solar Energy Materials and Solar Cells*, 95(6), 1421–1436. <https://doi.org/10.1016/j.solmat.2010.11.028>
- Ong, S. P., Richards, W. D., Jain, A., Hautier, G., Kocher, M., Cholia, S., Gunter, D., Chevrier, V. L., Persson, K. A., & Ceder, G. (2013). Python Materials Genomics (pymatgen): A robust, open-source python library for materials analysis. *Computational Materials Science*, 68, 314–319. <https://doi.org/10.1016/j.commatsci.2012.10.028>
- Parr, R. G., & Weitao, Y. (2015). *Density-Functional Theory of Atoms and Molecules*. Oxford University Press.
- Peter, L. M. (2011). Towards sustainable photovoltaics: The search for new materials. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*. <https://doi.org/10.1098/rsta.2010.0348>
- Qian, G. X., Martin, R. M., & Chadi, D. J. (1988). First-principles study of the atomic reconstructions and energies of Ga- and As-stabilized GaAs(100) surfaces. *Physical Review B*, 38(11), 7649–7663.

Jessie Manopo, 2021

ANALISIS PENGARUH DEFEK Cu_{Zn}+Zn_{Cu} PADA KRISTAL Cu₂ZnSnS₄ SEBAGAI MATERIAL SEL SURYA MENGGUNAKAN TEORI FUNGSI KERAPATAN

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

<https://doi.org/10.1103/PhysRevB.38.7649>

Röhle, S. (2016). Tabulated values of the Shockley-Queisser limit for single junction solar cells. *Solar Energy*, 130, 139–147.

<https://doi.org/10.1016/j.solener.2016.02.015>

Sarmadian, N., Saniz, R., Partoens, B., & Lamoen, D. (2016). First-principles study of the optoelectronic properties and photovoltaic *absorber* layer efficiency of Cu-based chalcogenides. *Journal of Applied Physics*.

<https://doi.org/10.1063/1.4961562>

Satale, V. V., & Bhat, S. V. (2020). Superstrate type CZTS solar cell with all solution processed functional layers at low temperature. *Solar Energy*.

<https://doi.org/10.1016/j.solener.2020.07.055>

Schorr, S., Gurieva, G., Guc, M., Dimitrievska, M., Pérez-Rodríguez, A., Izquierdo-Roca, V., Schnohr, C. S., Kim, J., Jo, W., & Merino, J. M. (2019). Point defects, compositional fluctuations, and secondary phases in non-stoichiometric *kesterites*. *Journal of Physics: Energy*, 2(1), 012002.

<https://doi.org/10.1088/2515-7655/ab4a25>

Schorr, S., Hoebler, H.-J., & Tovar, M. (2007). A neutron diffraction study of the *stannite-kesterite* solid solution series. *European Journal of Mineralogy*, 65–73. <https://doi.org/10.1127/0935-1221/2007/0019-0065>

Seol, J. S., Lee, S. Y., Lee, J. C., Nam, H. D., & Kim, K. H. (2003). Electrical and optical properties of Cu₂ZnSnS₄ thin films prepared by rf magnetron sputtering process. *Solar Energy Materials and Solar Cells*.

[https://doi.org/10.1016/S0927-0248\(02\)00127-7](https://doi.org/10.1016/S0927-0248(02)00127-7)

Shockley, W., & Queisser, H. J. (1961). Detailed balance limit of efficiency of p-n junction solar cells. *Journal of Applied Physics*, 32(3), 510–519.

<https://doi.org/10.1063/1.1736034>

Jessie Manopo, 2021

ANALISIS PENGARUH DEFEK Cu_{Zn}+Zn_{Cu} PADA KRISTAL Cu₂ZnSnS₄ SEBAGAI MATERIAL SEL SURYA MENGGUNAKAN TEORI FUNGSI KERAPATAN

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

- Sholl, D. S., & Steckel, J. A. (2009). Density Functional Theory: A Practical Introduction. In *Density Functional Theory: A Practical Introduction*.
<https://doi.org/10.1002/9780470447710>
- Tanaka, T., Nagatomo, T., Kawasaki, D., Nishio, M., Guo, Q., Wakahara, A., Yoshida, A., & Ogawa, H. (2005). Preparation of Cu₂ZnSnS₄ thin films by hybrid sputtering. *Journal of Physics and Chemistry of Solids*.
<https://doi.org/10.1016/j.jpcs.2005.09.037>
- Thomas, L. H. (1927). The calculation of atomic fields. *Mathematical Proceedings of the Cambridge Philosophical Society*, 23(5), 542–548.
<https://doi.org/10.1017/S0305004100011683>
- Villaseñor, E. J. S. (2008). Introduction to Quantum Mechanics. *AIP Conference Proceedings*, 1023, 107–117. <https://doi.org/10.1063/1.2958160>
- Walsh, A., Chen, S., Wei, S.-H., & Gong, X.-G. (2012). Kesterite Thin-Film Solar Cells: Advances in Materials Modelling of Cu₂ZnSnS₄. *Advanced Energy Materials*, 2(4), 400–409. <https://doi.org/10.1002/aenm.201100630>
- Xiao, W., Wang, J. N., Wang, J. W., Huang, G. J., Cheng, L., Jiang, L. J., & Wang, L. G. (2016). Structural and electronic properties of the heterointerfaces for Cu₂ZnSnS₄ photovoltaic cells: A density-functional theory study. *Physical Chemistry Chemical Physics*.
<https://doi.org/10.1039/c6cp00817h>
- Xiao, W., Wang, J. N., Zhao, X. S., Wang, J. W., Huang, G. J., Cheng, L., Jiang, L. J., & Wang, L. G. (2015). Intrinsic defects and Na doping in Cu₂ZnSnS₄: A density-functional theory study. *Solar Energy*, 116, 125–132.
<https://doi.org/10.1016/j.solener.2015.04.005>
- Yu, L., & Zunger, A. (2012). Identification of potential photovoltaic *absorbers* based on first-principles spectroscopic screening of materials. *Physical Jessie Manopo, 2021*
- ANALISIS PENGARUH DEFEK Cu_{Zn}+Zn_{Cu} PADA KRISTAL Cu₂ZnSnS₄ SEBAGAI MATERIAL SEL SURYA MENGGUNAKAN TEORI FUNGSI KERAPATAN**

Review Letters. <https://doi.org/10.1103/PhysRevLett.108.068701>

Zhang, S. B., & Northrup, J. E. (1991). Chemical potential dependence of defect formation energies in GaAs: Application to Ga self-diffusion. *Physical Review Letters*, 67(17), 2339–2342.
<https://doi.org/10.1103/PhysRevLett.67.2339>

Zhao, Y. F., Liu, Z. M., & Li, D. C. (2014). Theoretical study of structural, elastic properties and phase transitions of Cu₂ZnSnS₄. *Advanced Materials Research*, 1058, 113–117.
<https://doi.org/10.4028/www.scientific.net/AMR.1058.113>

Jessie Manopo, 2021

ANALISIS PENGARUH DEFEK Cu_{Zn}+Zn_{Cu} PADA KRISTAL Cu₂ZnSnS₄ SEBAGAI MATERIAL SEL SURYA MENGGUNAKAN TEORI FUNGSI KERAPATAN

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