

Name: M. S. Omar [Mustafa Saeed Omar] (Professor)
Date of birth: 1955 / Arbil, Kurdistan, Iraq
B.Sc.: Physics 1978, Department of Physics,
College of Science, University of Mosul, IRAQ

Ph.D.: Solid State Physics (Semiconductors), 1985
School of Physics, University of Bath, U.K

Title of the Ph.D. thesis:

“Crystal Growth and Characterization of I-IV₂-V₃ Semiconductor Compounds and alloys based thereon”

Place of work:

Department of Physics, College of Science, University of Salahaddin, Erbil,
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Thesis Supervised:

A- MSc Thesis

- 1-Temperature dependence of thermal properties of the system $CuGe_2P_3 - Cu_2GeS_3$ single crystal semiconductors (1989)
- 2- Temperature dependence of thermal properties of the doped $Ag_6Ge_{10}P_{12}$ single crystal semiconductor compound (1990)
- 3- Temperature dependence of thermo-magnetic properties of single crystals for the alloy system $CuGe_2P_3 - Ge$ (1990)
- 4-Doping effect on some physical properties of ternary semi-conducting compound $CuGe_2P_3$ (1991)
- 5- Temperature dependence of the optical properties of single crystal $ZnSiP_2$ compound semiconductor (1992)
- 6- Temperature dependence of thermal conductivity for some of II – IV – V₂ group semiconductors (1992)
- 7- Temperature dependence of lattice thermal conductivity for some of II – IV – V₂ group semiconductors (1993)
- 8- Theoretical calculations of the energy gap for some of group II – IV – V₂ semiconductor compounds (1994)
- 9- Temperature dependence of the magneto-optical properties for the semi-conducting compound $ZnGeP_2$ (1994)
- 10- Temperature dependence of the magneto-optical properties for the semi-conducting compound $CdGeP_2$ (1995)

- 11- Band structure calculations of **GaAs** by using OPW method (1996)
- 12- Band structure calculations of **AlP** by using OPW method (1996)
- 13- Temperature dependence of lattice thermal conductivity for some of $I - III - VI_2$ group semiconductors (2002)
- 14- Free carrier effect on the optical energy gap in some n-type compound semiconductors (2004)
- 15- Impurity effects on the energy gap in some $I - III - VI_2$ semiconductors (2005)
- 16- Lattice thermal conductivity in Si nanowire (2005)
- 17- Calculation of lattice thermal conductivity for a Si nanowire and the effect of Modified Gruneisen parameter (2007)
- 18- Calculations of lattice thermal conductivity in **CdS** quantum wires (2008)
- 19- Nanoscale size dependent lattice volume for Si Nanoparticles and Nanowires (2011)
- 20- Model modification of nanoscale size melting points and lattice volume of nanocrystals (2012)
- 21- Elastic properties of group IV nanoparticles (2015)

B- PhD Thesis

- 1- Investigation of the temperature dependence of the energy gap of some $III-V$ compound semiconductors by using OPW method of calculation (2004)
- 2- Physical properties of n-type **GaP** single crystal semiconductor compound (2005)
- 3- Magneto-optical properties in **GaP-InP** alloy system (2008)
- 4- Lattice thermal conductivity and structure of Silicon nanowires (2009)
- 5- Magneto-Physical properties of **InP** n-type compound semiconductor (2010)
- 6- Nanoscale Size Dependence Parameters on Lattice Thermal conductivity of GaN and GaAs Nanowires (2012)
- 7- Size dependent energy gap of Si nanowire computed using empirical Pseudopotential method (2012)

Current research projects:

- *Thermodynamical Properties of Near Critical Diameter for Si and related Nanocrystal Materials (Cooperative work, *Jilin University, China*), (PhD Project)
- *Surface Structure Geometrical Formation of Group IV Nanoparticles, (MSc Project)
- * Debye-Einstein Approximation Based Model for calculating Lattice Thermal Expansion in Nanoscale Size Dependence of Silicon (Group research activity)
- *Structure and Thermal Properties for Elementary and Binary Tetrahedral Semiconductor Nanoparticles (Submitted for publication 2015)

Projects under construction

- *Preparation and Thermal Properties of Some Ternary Alloys Based on III_2-VI_3 Compound Semiconductors (Cooperative work, *McMaster University, Canada*)

(PhD Project)

*Scintillator Crystal Growth and its Applications

(Cooperative work, *FIZK University, USA*)

(PhD Project)

Books Published

Physical Properties of N-Type GaP Single Crystal Semiconductor 2010

M S Omar and T A Abbas, LAMBERT Academic Publishing, Germany

Published articles:

- 1) The elastic behavior of the ternary Zincblende structure semiconductor CuGe_2P_3
T.V. Hailing, G.A. Saunders, **M. S. Omar** and B.R. Pamplin
Phys. Chem. Solids. 45,2,163(1984)
- 2) CuGe_2P_3 and its alloy with Ge.
B.R. Pamplin and **M. S. Omar**
Progress in crystal growth and characterization. 10, 123(1985)
- 3) Infrared reflectivity of CuGe_2P_3
V. Riede, H. Neumann, H. Sobatta, W. Kissinger, **M.S. Omar** and
B.R. Pamplin
Phys. Stat. Sol. (b) 123, K119 (1984)
- 4) Comparison of the elastic behavior of CuGe_4P_3 with that of CuGe_2P_3
J.E. Macdonald, G.A. Saunders and **M. S. Omar**
Phys. State Sol. (a) 89, K137 (1985)
- 5) Infrared reflectivity of $\text{Ag}_6\text{Ge}_{10}\text{P}_{12}$
H. Neumann, V. Riedi, H. Sobotta, **M. S. Omar** and B.R. Pamplin
Solid State communication. 53, 2, 155(1985)
- 6) High temperature lattice thermal expansion of CuGe_2P_3 -0.8 Cu_2GeS_3 alloy.
G. Bhikshamaiah, M.V. Subrahmanya Sarma, S.V. Suryanarayana and
M. S. Omar
J. of less. Common. Metals. 113, L5 (1985)
- 7) Lattice thermal expansion of CuGe_2P_3 -0.5 Cu_2GeS_3
G. Bhikshamaiah, S.V. Suryanarayana and **M. S. Omar**
J. of Mat. Sci. letters. 5, 121(1986)
- 8) High temperature heat capacity, Thermodynamic properties and Debye temperature
of CuGe_4P_3
H. Neumann, E. Nowak and **M. S. Omar**
Cryst. Res. Technol. 22, n,1437(1987)
- 9) Heat capacity and Gruneisen function in CuGe_4P_3
H. Neumann, E. Nowak and **M. S. Omar**

- J. of less. Common. Metals. 132, L13 (1987)
- 10) Thermoelectric power in the Ternary Doped CuGe_4P_3 compound.
M. S. Omar, M.M. Ameen, I.M. Murad and M.H. Hanna
 Zanco, The Sci. j. of Salahaddin Uni. 1, 1, 55 (1988)
 - 11) High-temperature lattice thermal expansion of some mixed crystals of the
 $\text{CuGe}_2\text{P}_3 - \text{Cu}_2\text{GeS}_3$
 G Bhikshamaiah, SV Suryanarayana, **M. S. Omar**
 Journal of material Science Letters Vol 7, No. 5, 433 (1988)
 - 12) Infrared Optical Characterization of $(\text{Cu}_2\text{GeSe}_3)_{1-x}(\text{CuGe}_4\text{P}_3)_x$ mixed crystals
 V. Riede, N. Sharif, H. Neumann, **M.S. Omar** and H. Sobatta
 Cryst. Res. Technol. 22, 5, 677(1988)
 - 13) A simple technique of crystal growth for materials containing high volatile
 components
M. S. Omar
 J. of synth. Cryst., 17, 2, 118 (1988)
 - 14) Lattice thermal expansion of CuSi_4P_3
 G Bhikshaiah, SV Suryanarayana and **M. S. Omar**, Journal of Material Science
 Letters, Vol. 7, No. 10, 1074(1988)
 - 15) Heat capacity of $\text{Ag}_6\text{Ge}_{10}\text{P}_{12}$ from 180 to 550K
 E. Nowak, H. Neumann, M S Omar
 Cryst. Res. Technol. 23, 1, 103(1988)
 - 16) Infrared lattice vibrations in CuGe_2P_3 .
 H. Neumann, N. Sharif, V. Riede, **M. S. Omar** and H. Sobotta.
 Cryst. Res. Technol. 24, 3, 317(1989)
 - 17) Infrared lattice vibrations and crystal structure of $\text{Cu}_2\text{Ge}_2\text{S}_3$.
 H. Neumann, V. Riede, N. Sharif, H. Sobotta., and **M. S. Omar**
 Cryst. Res. Technol., 24, 2, 227 (1989)
 - 18) Infrared optical properties of $(\text{CuGe}_2\text{P}_3)_{1-x}(\text{6Ge})_x$ solid solutions.
 V. Riede, N. Sharif, H. Neumann, H. Sobotta., and **M. S. Omar**
 Cryst. Res. Technol. 24, 4, 453(1989)
 - 19) Crystal structure determination of the ternary semiconductor compound Cu_2GeS_3
M. S. Omar, A.K. Aziz, M.A. Saeed, H.M. Ahmad.
 J. Math. Phys. (Iraqi society of physics and mathematics), 11(1), 39 (1989)

- 20) Infrared reflectivity study of $(Cu_2GeS_3)_{1-x}(CuGe_2P_3)_x$ solid solutions
H. Neumann, N. Sharif, V. Riede, H. Sobotta., and **M. S. Omar**
J. Mat. Sci. Lett. (UK), 9, 2,181 (1990)
- 21) Crystal growth and investigation of the solid solutions of the system
 $(CuGe_2P_3-I_2-IV-VI_3)$
M. S. Omar.
Materials Research Bulletin. Vol. 25, 6, 691(1990)
- 22) Thermal properties of Ternary crystal semi conducting compound $CuGe_2P_3$
M. S. Omar, M. M. Ameen and I.M. Murad
Zanco, the Sci. J. of Salahaddin Uni. 4, 4, (1991)
- 23) Thermal conductivity of ternary $Ag_6Ge_{10}P_{12}$ crystal semiconductor.
M. S. Omar
J. Nat. Sci. 2, (2), 44, (1993)
- 24) X-ray determination of lattice thermal expansion of $CuSi_{2+x}P_3$ ($x=1,2$) at elevated temperature
G Bhikshamaiah, **M. S. Omar** and SV Suryanarayana
Cryst. Res. Technol. 29, 7, 277, (1994)
- 25) A Triclinic super lattice structure for the bended sphalerite unit cell of the compound Cu_2GeS_3
M. S. Omar
Arab gulf J. Scient. Res., 15, (2), 353, (1997)
- 26) Tin solution growth and the analysis of single crystals of $CuSi_2P_3$ semiconductor.
M. S. Omar
J. of synth. Cryst. 27, 2, 19, (1998)
- 27) Temperature dependence of the optical properties of $ZnGeP_2$ semiconductor compound
M. S. Omar, B. M. Omar and F. A. Mahmood.
Arab gulf J. Scient. Res., 17, (1), 59, (1999)
- 28) The temperature dependence of the energy gap of $CdGeP_2$ semiconductor
M. S. Omar, A.S. Karim and S.O. Yousif
J. of Zankoy Sulaimani (JZS), Iraq, A4, (1), 37, (2001)
- 29) Optical properties of ternary semiconducting compound $CuGe_2P_3$
M. S. Omar
J. of Dohuk university (Iraqi Kurdistan), Iraq, 5, 2, 123, (2002)
- 30) Temperature dependence of the optical properties of semiconducting compound $ZnSiP_2$

- M. S. Omar**, F. A. Mahmood and B. M. Omar
J. of Dohuk university (Iraqi Kurdistan), Iraq, 5, 2, 127(2002)
- 31) Magnetic effect on the optical energy gap of $ZnGeP_2$ single crystal.
M. S. Omar, F. A. Farhad, and S. R. Saeed
(JZS) Jornal of Zankoy Sulaimani, Iraq, 5(2), A29(2002)
- 32) Carrier concentration effect on the optical absorption limit in $ZnSnAs_2$
M. S. Omar
J. of Dohuk university (Iraqi Kurdistan), Iraq, 6, 1, 90, (2003)
- 33) Temperature dependence of lattice thermal conductivity for some of $I-III-VI_2$ group compound semiconductors
M. S. Omar, H. M. Ahmad and S. M. Mamand.
(JZS) Jornal of Zankoy Sulaimani, Iraq, 7(1), A7(2004)
- 34) Impurity effects on the lattice thermal conductivity in the ternary $CuGe_2P_3$ semiconductor
M. S. Omar
(JZS) Jornal of Zankoy Sulaimani, Iraq, 7(1), A17(2004)
- 35) The optical energy gap dependence on both carrier concentration and intrinsic energy gap in n-type semiconductors
M. S. Omar and F. Y. Gorges
Materials Science in Semiconductor Processing 9, 164(2006)
- 36) Lattice thermal expansion for normal tetrahedral compound semiconductors
M. S. Omar
Materials Research Bulletin, 42, 319(2007)
- 37) Magneto-thermal properties for a single crystal GaP
M S Omar and T A Abbas
PBU6, AIP, KP899, 269 (2007)
- 38) A simple Operated Multi-Purpose Temperature Control Cryostat
T A Abbas and **M S Omar**
J. of Zhejiang Univ. Sci. A 8(5), 793(2007)
- 39) A Modified Model for Calculating Lattice Thermal Expansion of $I_2 - IV - VI_3$ and $I_3 - V - VI_4$ Tetrahedral Compounds.

- M S Omar**
Materials Research Bulletin, 42, 961(2007)
- 40) Magneto-Optical properties of the alloy system $\text{Ga}_x\text{In}_{1-x}\text{P}$
M S Omar and S.O. Yousif
FIZIKA A 18, 4, 165(2009)
- 41) Lattice Dislocation in Si Nanowires
M S Omar and H T Taha
Physica B 404, 5203(2009)
- 42) Magneto-Optical Properties of GaP Single Crystal
M S Omar and T A Abbas
Iranian Journal of Physics Research, 9 (4) 99(2010)
- 43) Effects of Nanoscale Size Dependent Parameters on Lattice Thermal Conductivity in Si Nanowire
M S Omar and H. T. Taha
Sadhana - Indian Academy of Science, 35 (2), 177(2010)
- 44) Lattice Thermal Expansion and Ionicity for $\text{III}_2\text{-VI}_3$ Binary Defect Tetrahedral Compound Semiconductors and Their Alloy
M S Omar
Int. J. of Thermophysics, 31(6), 1186(2010)
- 45) Models for Calculating Mean Bonding Length of Au Nanoparticles
A. AlAssaf and **M S Omar**
(Accepted for Publication in Journal of College of Education, Mosul University in Iraq 2011)
- 46) Nanoscale Size Dependence Parameters on Lattice Thermal conductivity of Wurtzite GaN Nanowires
S. M. Mamand, **M. S. Omar** and A. J. Muhammed
Materials Research Bulletin 47, 1264(2012)
- 47) Calculation of Lattice Thermal Conductivity of Suspended GaAs Nanobeams: Effect of Size Dependent Parameters
S. M. Mamand, **M. S. Omar** and A. J. Muhammed
Advanced Materials Letters, 3(6) 449(2012)
- 48) Models for Mean bonding length, Melting point and Lattice thermal expansion for Nanoparticle Materials
M S Omar
Materials Research Bulletin 47, 3518(2012)
- 49) Critical Size Structure Parameters for Au Nanoparticles

M S Omar

Advanced Materials Research 626, 976 (2013)

Trans Tech Publications, Switzerland

50) Effect of Parameters on Lattice Thermal Conductivity in Germanium Nanowires

S. M Mamand and **M S Omar**

Advanced Material Research, 832, 33 (2014)

Trans Tech Publications, Switzerland

51) Structure and thermal Properties of Elementary and Binary Tetrahedral Semiconductor Nanoparticles

M. S. Omar,

International Journal of Thermophysics, 37, 11(2016)

52) Botan. Jawdat Abdullah, Q. Jiang and M S omar, Effects of size on mass density and its influence on mechanical and thermal properties of ZrO₂ nanoparticles in different structures_Bulletin of Materials Science39(5)2016

52) Magneto-Optical and Thermoelectric Properties of n-InP Semiconductor Single Crystals

M. S. Omar, G. M. Khalil and N. Sun

APMAS 2014, Oludeniz, Mugla, Turkey

International Conferences Attended

6th International Conference on Ternary and Multinary Compounds (ICTMC1984)
August 15-17, 1984, Caracas, Venezuela

11th International Conference on Defects-Recognition Imaging and Physics in semiconductors (DRIP-XI), September 13-19 2005, Beijing, China

6th International Conference of the Balkan Physical Union, 22-26 AUGEST 2006,
Istanbul, Turkey

25th international Conference on Defects in Semiconductors ICDS2011), July 20-24,
2009, St Petersburg, Russia,

International Conference on Nanomaterials and Nanotechnology (ICNANO2011), 18-21
December 2011, New Delhi, India

International Conference on Advanced Material Engineering & Technology
(ICMAET2012), November 28-30, 2012, Batu Feringhi, Penang Island, Malaysia,

International Advances in Applied Physics & Materials Science Congress & Exhibition
23-27 April, 2014 (APMAS 2014), Oludeniz, Mugla, Turkey

