Dr N DHARMARAJ

Professor & Director i/c (BUPGERC)
Department of Chemistry

Bharathiar University
Coimbatore, 641046
Tamil Nadu

E-mail: dharmaraj@buc.edu.in
Phone: 9442007585
Office Number:

Research Area

- Bio-inorganic and Co-ordination Chemistry
- Catalysis (Heterogeneous & Homogeneous)
- Nanomaterials
- Spectroscopy

Courses Teaching

- POST-GRADUATE COURSE IN CHEMISTRY

Research Experience: 25

Teaching Experience: 25

Research Credentials (as on August 2024 – Source: Google scholar)

H-index: 38 Citations: 5925 i10-index: 68

Publications

International Journals: 61

Career

Other Institutes

1. Designation : Lecturer

Institution Name : Tamilnadu Government Collegiate Educational Service
Period : October 1998 - July 2007

At Bharathiar University

1. Designation : Professor

Period : July 2013 - Till Date

2. Designation : Associate Professor

Period : July 2010 - July 2013

3. Designation : Reader

Period : July 2007 - July 2010

Education

Ph. D.

Subject : Chemistry
Institution : Department of Chemistry
Affiliated University : Bharathiar University
Year of Award :

Projects

National Level

Ongoing - completed - 1

Research Guidance

Completed

Ph.D. - 9

On Going

Ph.D. - 2

Dr N DHARMARAJ , Professor & Director i/c (BUPGERC) , Department of Chemistry

Visits

1. Post-doctoral researcher (2004-05-26 - 2003-06-25)
2. Brain Pool Visiting Professor (2005-01-12 - 2005-12-22)
3. International Conference presentation (2005-08-25 - 2005-08-27)
4. International Conference presentation (2005-11-24 - 2005-11-26)
5. Invited Lecture in International Conference (2012-10-25 - 2012-10-27)

Collaborations

1. INSA-Exchange Scientist (2009-09-01 - 2009-09-30)

Publications

International Journals - 61

61. Benzothiazole-based Schiff base for sensing Ca2+ ions: Synthesis, DFT studies, toxicity evaluation in Zebrafish embryo and in silico analysis of MMP-9 inhibition

Journal of Photochemistry & Photobiology: A Chemistry (August 2024)
G. Sathiyaraj M. Akilesh , A. Vignesh, K. Naveen Kumar, S. Gopinath S. Mohanapriya , J.M. Malecki, K. Kadirvelu , R. Shankar N. Dharmaraj

60. 3-Arylcoumarin Scaffolds From 3-Chlorocoumarin and Arylboronic Acids via Site-Selective C Cl Bond Activation With Palladium Complexes of N?O Chelating Hydrazones

Applied Organometallic Chemistry, 2024; 0:e7709https://doi.org/10.1002/aoc.7709 (August 2024)
C. Shalini M. Akilesh, G. Sathiyaraj N. S. P. Bhuvanesh K. S. NeethuM. V. Kaveri

59. Investigation on chloro-bridged binuclear copper(II) complexes as potent metallodrug candidates against colon cancer via chemical and biological assessments

New Journal of ChemistryVolume 48 (March 2024)
Neethu Sankar, Badhmapriya Devarajan, Akilesh Manimuthu, Bhuvanesh Nattamai S. P., Dharmaraj Nallasamy and Kaveri M.V.

58. Palladium (II) Pincer Type Complexes Containing ONO Donor Heterocyclic Hydrazones: Synthesis, Structure and Catalytic Activity Towards the Suzuki–Miyaura Cross-Coupling

Catalysis LettersVolume 154(1) (January 2024)
C Shalini, N Dharmaraj, NSP Bhuvanesh and .M.V. Kaveri

57. Review on applications of Pullulan in bone tissue engineering: Blends and composites with natural and synthetic polymers

Polymers and Polymer CompositesVolume 31, Pages 1 - 113 (2023)DOI: 10.1177/09673911231192810 (July 2023)
M Manivannan, S Sathiya Nathan, P Sasikumar, L Ramkumar, D Navaneethan, P Prabu, F Mary Anjalin, N Dharamarj, Mohammed S Alqahtani, Mohamed Abbas

56. Palladium oxide nanofibers: an efficient catalyst for cross-coupling of challenging aromatic nitriles

Chemical PapersVolume 77, pages 3911–3920, (2023)https://doi.org/10.1007/s11696-023-02751-1 (March 2023)
S Thenmozhi, N Dharmaraj, and K Kadirvelu

55. Palladium(II) Pincer Type Complexes Containing ONO Donor Heterocyclic Hydrazones: Synthesis, Structure and Catalytic Activity Towards the Suzuki–Miyaura Cross?Coupling of 3?Bromochromone and Arylboronic Acids via C–Br Activation

Catalysis Lettershttps://doi.org/10.1007/s10562-023-04276-4 (February 2023)
C. Shalini, N. Dharmaraj, Nattamai S.P. Bhuvanesh and M.V. Kaveri

54. Suzuki Miyaura cross-coupling of 2-chloropyrazine with arylboronic acids catalyzed by novel palladium(II) ONO pincer complexes

Inorganica Chimica Acta 540 (2022) 121028https://doi.org/10.1016/j.ica.2022.121028 (May 2022)
C. Shalini, N. Dharmaraj, Nattamai S.P. Bhuvanesh and N. Dharmaraj

Dr N DHARMARAJ , Professor & Director i/c (BUPGERC) , Department of Chemistry

53. Delineating the Role of Substituents on the Coordination Behavior of Aroylhydrazone Ligands in PdII Complexes and their Influence on Suzuki–Miyaura Coupling in Aqueous Media

European Journal of Inorganic Chemistry 2019, 3869–3882 (July 2019)
Arumugam Vignesh. Chinnuswamy Shalini, Nallasamy Dharmaraj, Werner Kaminsky, and Ramasamy Karvemb

52. Mixed valent/geometry, linear, tetranuclear nickel complex bearing ONO pincer ligand exhibiting hitherto unknown ligation mode

Polyhedron, Volume 143 Pages 157–164 (2018)https://doi.org/10.1016/j.poly.2017.09.040 (June 2018)
C. Shalini, A. Vignesh, W. Kamnisky and N. Dharmaraj

51. Green Synthesis of 1,1?-Carbonyldiimidazole Using Copper Oxide Nanofiber as a Heterogeneous Catalyst

Journal of Nanoscience and Nanotechnology, Volume 18(1), pages 234-241 (2018) (April 2018)
S. Thernmozhi, K. Kadirvelu and N. Dharmaraj

50. Electrospun nanofibers: New generation materials for advanced applications

Material Science and Engineering B, 217, 36 (2017) (October 2017)
S. Thenmozhi, N. Dharmaraj, K. Kadirvelu and H. Y. Kim,

49. Arylation of N-methyl-2-oxindole with arylboronic acids in water catalyzed by Pd(II) pincer complex with low catalyst loading (Journal cover page article).

ChemCatChem, 9, 910 (2017). (Journal cover page article). (June 2017)
A. Vignesh, Werner Kaminsky and N. Dharmaraj,

48. A theoretical study on the stability of CNT encased cyclic peptide beyond hydrogen bond cut-off

Journal of Biomolecular Structure and Dynamics Volume 36, 2018 - Issue 5 (April 2017)
Subramanian Vidhyasankar,Nallasamy Dharmaraj and Ponmalai Kolandaivel

47. Conversion of Arylboronic Acids to Tetrazoles Catalyzed by ONO Pincer-Type Palladium Complex

The Journal of Organic ChemistryDOI: 10.1021/acs.joc.6b02277J. Org. Chem. 2017, 82, 887?892 (November 2016)
Arumugam Vignesh, N.S.P. Bhuvanesh and N. Dharmaraj

46. Expeditious assembly of fluorenones through domino reactions of benzoyl chlorides with arylboronic acids catalyzed by ONO pincer like palladium(II) complexes.

ChemCatChem, 8, 3207 (2016) (October 2016)
A.Vignesh, Werner K. and N. Dharmaraj,

45. Expeditious Assembly of Fluorenones through Domino Reactions of Benzoyl Chlorides with Arylboronic Acids Catalyzed by ONO Pincer-like Palladium(II) Complexes

ChemCatChem 2016, 8, 3207 – 3212DOI : 10.1002/cctc.201600717 (September 2016)
Arumugam Vignesh, Werner Kaminsky and Nallasamy Dharmaraj

44. Palladium complexes catalyzed regioselective arylation of 2-oxindole via in situ C(sp2)OH activation mediated by PyBroP

Journal of Organometallic Chemistry 824 (2016) 7-14 (September 2016)
A. Vignesh, Werner Kaminsky and N. Dharmaraj

43. Pd(II) pincer type complex catalyzed tandem C–H and N–H activation of acetanilide in aqueous media: a concise access to functionalized carbazoles in a single step

Green Chemistry 18, 3295 (2016). (April 2016)
A. Vignesh, Werner Kaminsky and N. Dharmaraj

42. Synthesis and Characterization of Zinc–Tin–Vanadium Oxide Nanocomposites for Oxygen Sensing Applications

Sensor LettersVolume 14(2), Pages 164-170 (2016) https://doi.org/10.1166/sl.2016.3612 (February 2016)
Chitra, M. Uthayarani, K, Rajasekaran, N,; Neelakandeswari, N, Girija, E. K. and Dharmaraj, N

41. Solvent assisted formation of ruthenium(iii) and ruthenium(ii) hydrazone complexes in one-pot with potential in vitro cytotoxicity and enhanced LDH, NO and ROS release

Dalton Transactions,Dalton Trans., 2016,45, 1693-1707 (December 2015)
E. Jayanthi, S. Kalaiselvi, V. Vijaya Padma, Nattamai S. P. Bhuvanesh and Nallasamy Dharmaraj

40. ONO pincer type Pd(II) complexes: synthesis, crystal structure and catalytic activity towards C-2 arylation of quinoline scaffolds

RSC Advances 2015, 5, 77948DOI: 10.1039/c5ra15342e (September 2015)
Vignesh Arumugam, Werner Kaminsky and Dharmaraj Nallasamy

39. Synthesis and characterization of ruthenium(II) hydrazone complexes as anticancer chemotherapeutic agents: in vitro DNA/BSA protein binding and cytotoxicity assay

Journal of Coordination ChemistryVolume 68(20) pages 3551-3565 (2015) https://doi.org/10.1080/00958972.2015.1077950 (August 2015)
E.. Jayanthi,M. Anusuya,N.S.P. Bhuvanesh,K.A. Khalil and N. Dharmaraj

38. Palladium(II) complexes containing ONO tridentate hydrazone for Suzuki–Miyaura coupling of aryl chlorides in aqueous-organic media† Vignesh Arumugam,a Werner Kaminsky,b Nattamai S. P. Bhuvaneshc and Dharmaraj Nallasamy

RSC Advances 2015, 5, 59428DOI: 10.1039/c5ra10973f (July 2015)
Vignesh Arumugam, Werner Kaminsky, Nattamai S. P. Bhuvanesh and Dharmaraj Nallasamy

37. Synthesis, characterization, DNA/protein binding and in vitro cytotoxic evaluation of new Ru(III) complexes containing aroylhydrazone ligands: Does hydrogen bonding influence the coordination behavior of hydrazones?

Inorganica Chimica ActaVolume 429, Pages 148-159 (2015) (April 2015)
E. Jayanthi, S. Kalaiselvi, V. Vijaya Padma, Nattamai S.P. Bhuvanesh and N. Dharmaraj

36. Effect of sintering temperature on structural and optical properties of indium (III) oxide nanoparticles prepared with Triton X-100 by hydrothermal method

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, Volume 133, Pages335-339 (2014) (December 2014)
D. Selvakumar, N Dharmaraj, K Kadirvelu, NS Kumar, VC Padaki

35. Binuclear copper complexes: Synthesis, X-ray structure and interaction study with nucleotide/protein by in vitro biochemical and electrochemical analysis

European Journal of Medicinal Chemistry 78, 281 (2014) (May 2014)
M. Alagesan, N. S. P. Bhuvanesh and N. Dharmaraj,

34. DNA/protein interaction and cytotoxicity of palladium(II) complexes of thiocarboxamide ligands

Inorganica Chimica ActaVolume 416, Pages 1-12 (2014)https://doi.org/10.1016/j.ica.2014.03.002 (May 2014)
Elangovan Sindhuja , Rengan Ramesh , Nallasamy Dharmaraj , Yu Liu

33. An investigation on new ruthenium(ii) hydrazone complexes as anticancer agents and their interaction with biomolecules

Dalton TransactionsDalton Trans., 2014,43, 6087-6099 (February 2014)
M. Alagesan, Nattamai S.P. Bhuvanesh and Nallasamy Dharmaraj

32. Cetyltrimethylammonium bromide- and ethylene glycol-assisted preparation of mono-dispersed indium oxide nanoparticles using hydrothermal method

Chemical PapersVolume 68, pages 1079–1086, (2014) (February 2014)
Selvakumar Dhanasingh, Dharmaraj Nallasamy, Saravanan Padmanapan and Vinod Chidambar Padaki

31. Potentially cytotoxic new copper(ii) hydrazone complexes: synthesis, crystal structure and biological properties

Dalton TransactionsDalton Trans., 2013,42, 7210-7223 (February 2013)
M. Alagesan, Nattamai .S.P. Bhuvanesh and N. Dharmaraj

30. MESOPOROUS NICKEL HYDROXYAPATITE NANOCOMPOSITE FOR MICROWAVE ASSISTED HENRY REACTION

TETRAHEDRON LETTERSVolume 53(24), Pages 2980 - 2984(2012) (November 2012)
N. NEELAKANDESWARI, G sANGAMI, P. EMAYAVARAMBAN, R. kARVEMBU, N. DHARMARAJ and hAK yONG kIM

Dr N DHARMARAJ , Professor & Director i/c (BUPGERC) , Department of Chemistry

29. Nickel and cobalt complexes of benzoic acid (2-hydroxy-benzylidene)-hydrazide ligand: synthesis, structure and comparative in vitro evaluations of biological perspectives† Paramasivam Krishnamoorthya, Palanisamy Sathyadevia, Packianathan Thomas Muthi

RSC Advances,RSC Adv., 2012, 2, 12190-12203DOI: 10.1039/C2RA20597A (October 2012)
Pramasivam Krishnamoorthy, Palanisamy Sathyadevi, Packianathan Thomas Muthiah and Nallasamy Dharmaraj

28. Organometallic ruthenium(II) complexes: Synthesis, structure and influence of substitution at azomethine carbon towards DNA/BSA binding, radical scavenging and cytotoxicity

European Journal of Medicinal Chemistry 55, 420 (2012). (July 2012)
P. Sathyadevi, P. Krishnamoorthy, N.S.P. Bhuvanesh, P. Kalaiselvi, V. Vijaya Padma and N. Dharmaraj

27. Variation in the biomolecular interactions of nickel(ii) hydrazone complexes upon tuning the hydrazide fragment

Dalton TransactionsDalton Trans., 2012,41, 6842-6854 (April 2012)
P.Krishnamoorthy, P. Sathyadevi, Rachel R. Butorac Alan H. Cowley Nattamai S. P. Bhuvanesh and Nallasamy Dharmaraj

26. Synthesis of novel heterobimetallic copper(i) hydrazone Schiff base complexes: A comparative study on the effect of heterocyclic hydrazides towards interaction with DNA/protein, free radical scavenging and cytotoxicity

Metallomics, Volume 4, Issue 5, May 2012, Pages 498–511, https://doi.org/10.1039/c2mt00004k (March 2012)
Palanisamy Sathyadevi, Paramasivam Krishnamoorthy, Rachel R Butorac, Alan H Cowley, Nallasamy Dharmaraj

25. Copper(i) and nickel(ii) complexes with 1?:?1 vs. 1?:?2 coordination of ferrocenyl hydrazone ligands: Do the geometry and composition of complexes affect DNA binding/cleavage, protein binding, antioxidant and cytotoxic activities?

Dalton TransactionsDalton Trans., 2012,41, 4423-4436 (February 2012)
P.Krishnamoorthy, P. Sathyadevi, Rachel R. Butorac Alan H. Cowley Nattamai S. P. Bhuvanesh and Nallasamy Dharmaraj

24. Effect of substitution and planarity of the ligand on DNA/BSA interaction, free radical scavenging and cytotoxicity of diamagnetic Ni(ii) complexes: A systematic investigation

Dalton TransactionsDalton Trans., 2011,40, 9690-9702 (August 2011)
P. Sathyadevi, P. Krishnamoorthy, Rachel R. Butorac Alan H. Cowley Nattamai S. P. Bhuvanesh and Nallasamy Dharmaraj

23. A Novel Bio-Nanocomposites Composed of Hydroxyapatite Reinforced with TiO2 Electrospun Nanofiber Consolidated Using High-Frequency Induction Heating

International Journal of Applied Ceramic Technology Volume8 (3) Pages 523-531 (2011)https://doi.org/10.1111/j.1744-7402.2010.02534.x (May 2011)
Khalil Abdelrazek Khalil, Sug Won Kim, Kwan Woo Kim, N. Dharmaraj, and Hak Yong Kim

22. Cellular uptake and in vitro drug release studies on paclitaxel-loaded poly (caprolactone)-grafted dextran copolymeric nanoparticles

Nanobiotechnology Volume 5, Pages 42-49 (2009) (December 2009)
P Prabu, Atul A Chaudhari, JA Ko, N Dharmaraj, SY Park and HY Kim, MS Khil

21. Preparation, characterization, in?vitro drug release and cellular uptake of poly(caprolactone) grafted dextran copolymeric nanoparticles loaded with anticancer drug

Journal of Biomedical Materials Research Part AVolume 90(4) Pages 1128-1136 (2009) (September 2009)
P Prabu, Atul A Chaudhari, N Dharmaraj, MS Khil, SY Park and HY Kim

20. Antimicrobial drug release scaffolds of natural and synthetic biodegradable polymers

Macromolecular ResearchVolume 16, Pages 303 - 307 (2008) (June 2008)
Periasamy Prabu, Kwan Woo Kim, Nallusamy Dharmaraj, Jong Hoon Park, Myung Seob Khil, Hak Yong Kim

19. In vitro evaluation of poly (caporlactone) grafted dextran (PGD) nanoparticles with cancer cell

Journal of Materials Science: Materials in MedicineVolume 19, Pages 2157 - 2163 (2008)DOIhttps://doi.org/10.1007/s10856-007-3307-z (May 2008)
P Prabu, Atul A Chaudhari, Santosh Aryal, N Dharmaraj, SY Park, WD Kim and HY Kim

18. Novel mechanism to improve toughness of the hydroxyapatite bioceramics using high-frequency induction heat sintering

Journal of Materials Processing Technology187, 417 – 420 (2007) (October 2007)
K.A. Khalil, S.W.Kim, N Dharmaraj, KW Kim, HY Kim

17. Preparation of mullite nanofibers via sol–gel and electrospinning techniques

International Journal of Electrospun Nanofibers and ApplicationsVolume 1(1) Pages 63 - 72 (2007) (July 2007)
N Dharmaraj, Chul Ki Kim, P Prabu, Bin Ding, Hak Yong Kim and P Viswanathamurthi

16. Radical scavenger for the stabilization of gold nanoparticles

Materials LettersVolume 61, Issues 19–20, Pages 4225-4230 (2007)https://doi.org/10.1016/j.matlet.2007.01.079 (February 2007)
Santosh Aryal, K.C. Remant Bahadur, Myeng Seob Khil, N. Dharmaraj and Hak Yong Kim

15. Synthesis and characterization of hydroxyapatite using carbon nanotubes as a nano-matrix S Aryal, KCR Bahadur, N Dharmaraj, KW Kim, HY Kim - Scripta Materialia,54,131- 134 (2006)

Scripta Materialia,54,131- 134 (2006) (November 2006)
S. Aryal, KCR Bahadur, N Dharmaraj, KW Kim, HY Kim

14. Synthesis of nickel oxide nanoparticles using nickel acetate and poly (vinyl acetate) precursor

Materials Science and Engineering: B Volume 128 (1-3), Pages 111-114 (2006) (August 2006)
N Dharmaraj, P Prabu, S Nagarajan, CH Kim, JH Park and HY Kim

13. Preparation and drug release activity of scaffolds containing collagen and poly(caprolactone)

Journal of Biomedical Materials Research Part AVolume 79 A(1), Pages 153-158 (2006) https://doi.org/10.1002/jbm.a.30715 (June 2006)
P. Prabu, N. Dharmaraj, Santosh Aryal, B.M. Lee, Vijaya Ramesh and H.Y. Kim

12. Novel amphiphilic triblock copolymer based on PPDO, PCL, and PEG: Synthesis, characterization, and aqueous dispersion

Colloids and Surfaces A: Physicochem. Eng. Aspects Volume 292 pages 69–78 (2007)doi:10.1016/j.colsurfa.2006.06.009 (June 2006)
Remant Bahadur K.C, Shanta Raj Bhattarai, Santosh Aryal, , Myung Seob Khil, N. Dharmaraj and Hak Yong Kim

11. Spectral studies of SnO2 nanofibres prepared by electrospinning method

Spectrochimica Acta Part A: Molecular and Biomolecular SpectroscopyVolume 64(1) Pages 136-140 (2006)https://doi.org/10.1016/j.saa.2005.07.007 (May 2006)
N. Dharmaraj, C.H. Kim,, H.Y. Kim and E.K. Suh K.W. Kim,

10. Effect of collector temperature on the porous structure of electrospun fibers

Macromolecular ResearchVolume 14, pages 59–65, (2006) (February 2006)
Chi Hun Kim, Yoon Ho Jung, Hak Yong Kim, Douk Rae Lee, Nallasamy Dharmaraj and Hak yung Eun Choi

9. Deposition of gold nanoparticles on electrospun MgTiO3 ceramic nanofibers

Journal of Nanoscience and NanotechnologyVolume 6(2), Pages 510-513 (2006)doi: 10.1166/jnn.2006.924. (February 2006)
Santosh Aryal , N Dharmaraj, Shanta Raj Bhattarai, Myung Seob Khil, and Hak Yong Kim

8. Spectroscopic identification of S-Au interaction in cysteine capped gold nanoparticles

Spectrochim Acta A Mol Biomol SpectroscVolume 663(1) Pages 160-163 (2006)doi: 10.1016/j.saa.2005.04.048. (January 2006)
Santosh Aryal Remant B K C, N Dharmaraj, Narayan Bhattarai, Chi Hun Kim and Hak Yong Kim

7. Pb(Zr0.5, Ti0.5)O3 nanofibres by electrospinning

Materials LettersVolume 59(24-25) Pages 3085-3089 (2005)https://doi.org/10.1016/j.matlet.2005.05.040 (October 2005)
N. Dharmaraj, C.H. Kim and H.Y. Kim

6. Nickel titanate nanofibers by electrospinning

Materials Chemistry and PhysicsVolume 87(1) Pages 5-9 (2004)https://doi.org/10.1016/j.matchemphys.2004.05.005 (September 2004)
N Dharmaraj , H.C Park , C.K Kim , H.Y Kim , D.R Lee

5. Preparation and morphology of magnesium titanate nanofibres via electrospinning

Inorganic Chemistry CommunicationsVolume 7(3) Pages 431-433 (2004)https://doi.org/10.1016/j.inoche.2003.12.033 (March 2004)
N. Dharmaraj, H.C. Park, B.M. Lee, P. Viswanathamurthi, H.Y. Kim and D.R. Lee

4. Binuclear ruthenium(III) complexes: synthesis, characterisation, catalytic activity in aryl–aryl couplings and biological activity

Transition Metal ChemistryVolume 27, pages 631–638, (2002) (September 2002)
Ramasamy Karvembu, Chinnasamy Jayabalakrishnan, Nallasamy Dharmaraj, Somanur V. Renukadevi and Karuppannan Natarajan

3. Ruthenium(II) complexes containing bidentate Schiff bases and their antifungal activity

Transition Metal ChemistryVolume 26, Pages 105-109 (2001) (February 2001)
N. Dharmaraj, P. Viswanathamurthi and K. Natarajan

2. Ruthenium(III) complexes with tetradentate Schiff bases containing triphenylphosphine or triphenylarsine

Transition Metal ChemistryVolume 23, pages 337–341, (1998) (August 1998)
Periasamy Viswanathamurthi, Nallasamy Dharmaraj, Sankaran Anuradha and Karuppannan Natarajan

1. Ruthenium(II) carbonyl complexes containing tetradentate Schiffbases

Transition Metal ChemistryVolume 23, pages 129–132, (1998) (April 1998)
Nallasamy Dharmaraj, Periasamy Viswanathamurthi, Pandi K. Suganthy and Karuppannan Natarajan

Projects

Completed - 1

1. Synthesis, characterization and applications of nanofibers prepared by Electrospinning technique
DRDO 30 lAKHS (June 2014 - May 2024)