

Dr Sivasakthi M



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Scientist C

Area: Material Chemistry

Affiliation: Centre for Waste Management, International Research Centre, Sathyabama Institute of Science and Technology, Chennai – 600 119

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About

I earned my M.Sc degree in Chemistry from Manonmaniam Sundaranar University, Tirunelveli in the year of 2011. I conducted my M.Phil research program from St John's College, Palayamkottai in the year of 2013. I qualified the national exams like CSIR-NET, SLET and GATE in chemical sciences with good ranking. I then joined in DST sponsored project as Junior Research fellow and worked on developing the high-temperature resistant geopolymeric composites and completed successfully. Simultaneously I pursued my PhD and it was focussed on the development of high-temperature resistant fly ash based geopolymers and their characterization for thermal, mechanical and microstructural properties and received PhD degree in the year of 2019. Since 2020, I held the position as Project Officer in SRMIST where I responsible for optimization of the geopolymer reaction parameters for various applications, Thermal resistant geopolymer composites using industrial by products and nano additives etc., and finding funding opportunities from various agencies. Also I have involved in many field implementation of geopolymer concretes like roads, utility building, railway sleeper, pavements etc.,

Education

PhD	Chemistry	SRM Institute of Science and Technology, Chennai (2019)
SLET	Chemical Sciences	2016
CSIR-NET	Chemical Sciences	2014
GATE	Chemical Sciences	2014
M.Phil	Chemistry	St John's College, Palayamkottai (2013)
M.Sc	Chemistry	Manonmaniam Sundaranar University, Tirunelveli (2009-2011)
B.Sc	Chemistry	Nazareth Margoschis College at Pillaiyanmanai (2006-2009)

Other Details

Academic Experience

- ▽ Project Officer, CACR, SRMIST (2020-2022)
- ▽ Junior Research Fellow, DST Project, SRMIST (2014-2018)
- ▽ Assistant Professor, TBAKC (2012-2013)

Research interests:

- ▽ Geopolymers – Chemical and engineering properties
- ▽ High temperature tolerant geopolymer composites,
- ▽ Chemistry of alkali silicates

- ▽ Chemistry of alkali alumino silicate gels
- ▽ Kinetics of geopolymerization
- ▽ Characterisation of geopolymers using advanced spectroscopic and microscopic techniques
- ▽ Encapsulation of heavy metals

Research Publications:

1. Vanitha N, Revathi T, Sivasakthi M, Jeyalakshmi R, Microstructure properties of poly(phospho-siloxo) geopolymeric network with metakaolin as sole binder reinforced with n-SiO₂ and n-Al₂O₃, *Journal of Solid State Chemistry* (Elsevier, IF 3.656).
2. Poornima N, Sivasakthi M, Jeyalakshmi R. Microstructure investigation of the Na/Ca aluminosilicate hydrate gels and its thermal compatibility in fly ash–GGBS cementitious binder. *Journal of Building Engineering*. 2022 Feb 5:104168. (Elsevier IF 7.144)
3. Srividya T, PR KR, Sivasakthi M, Sujitha A, Jeyalakshmi R. A state-of-the-art on development of geopolymer concrete and its field applications, *Case studies in Construction Materials*. 2022 Jun 1;16:e00812. (Elsevier, IF : 4.934)
4. Poornima Natarajan, Sivasakthi M, Revathi T, Jeyalakshmi, A comparative study on fly ash pozzolonic cement mortar and ambient cured alkali activated fly ash GGBS cement mortar after exposure to elevated temperature, *Innovative Infrastructure Solutions*, 2022 7 (30), (Springer, SNIP 0.996)
5. Sivasakthi M, Jeyalakshmi R, Rajamane N P, Effect of Molar Ratio of Water Glass on Microstructure Build Up of Fly Ash Geopolymers and its Thermal Properties, *Journal of building engineering*, 44, 102939, 2021 (Elsevier IF 7.144)
6. Poornima Natarajan, Dheeraj Katyal, Revathi T, Sivasakthi M, Jeyalakshmi R Effect of curing on mechanical strength and microstructure of fly ash and blend geopolymer, Portland cement and its behavior at elevated temperature, *Materials Today: Proceedings*, 2021 <https://doi.org/10.1016/j.matpr.2021.04.087> (Elsevier, Scopus, SNIP: 0.576).
7. Sivasakthi M, Jeyalakshmi R, Rajamane N P, Investigation of Microstructure and Thermomechanical Properties Of nano-TiO₂ Admixed Geopolymer For Thermal Resistance Applications, *Journal of Materials Engineering and Performance*, 30, 3642-3653, 2021 (SPRINGER, IF 1.895, Science Citation Index).
8. Sivasakthi M, Jeyalakshmi R, Rajamane N P, J Baskara sundararaj, Thermo Mechanical Properties of Fly Ash-Ground Granulated Blast Furnace Slag Based Geopolymer, *Research journal of chemistry and environment*, Vol 25(8), August 2021- (Scopus)
9. Sivasakthi M, Jeyalakshmi R, Rajamane N P, Fly Ash Geopolymer Mortar: Impact of the Substitution of River Sand by Copper Slag as a Fine Aggregate on Its Thermal Resistance Properties, *Journal of Cleaner Production*, 279 (2021) 1-13. (Elsevier, Science Citation Index, IF 11.072).
10. Sivasakthi M, Jeyalakshmi R, Rajamane N P, Rinu Jose, Thermal and structural micro analysis of micro silica blended fly ash based geopolymer composites, *Journal of Non-Crystalline Solids*, 499 (2018) 117–130. (Elsevier, Science Citation Index, IF 4.458, Scopus).
11. Sivasakthi M, Jeyalakshmi R, Rajamane N P, Rinu Jose, Evaluation of Suitability of Alumino-Silicate Precursor for Geopolymerization Through Advance Analytical Techniques, *Asian Journal of Chemistry*, Vol 30, No-8 (2018), 1771-1776. (Scopus)

12. N.P. Rajamane, R. Jeyalakshmi, M. Dhinesh, J. Baskara Sundraraj, T. Revathi and M. Sivasakthi , "Full scale production of clayless building blocks using geopolymerisation of industrial wastes fly ash and GGBS" Journal of Mines, Metals & Fuels, Jan 2018 P N:48-51. (Scopus)
13. Sivasakthi.M, Revathi.T, Jeyalakshmi.R, Rajamane N.P, (2016),"Use of analytical techniques for the identification of the geopolymer reactions" Oriental journal of Chemistry –2017, Vol. 33, No. (4). (Scopus).
14. Revathi.T, Sivasakthi.M, Jeyalakshmi.R, Rajamane N.P, (2016), "Evaluation of the role of Cetyltrimethylammoniumbromide(CTAB) and Acetylenic glycol(AG) admixture on fly ash based geopolymer", Oriental journal of Chemistry, 2017, Vol. 33, No. (2) P N: 783-792. (Scopus)
15. Sivasakthi M Jeyalakshmi R Rajamane N P Revathi T Dhinesh M, "High Temperature Studies On The Effect Of Addition of Zirconia In Alkali Activated Fly Ash (Geopolymer) and Fly Ash Blended Ordinary Portland Cement Mortar", Structural Engineering Convention (SEC-2016) e - Proceeding, P N 800-804 (e-Proceedings).
16. Jeyalakshmi R, Rajamane N P, Baskara Sundraraj J, Sivasakthi M and Namitha Lekshmi, Fire resistant low carbon foot print Geopolymer from Fly ash, ICI Journal, 2016, 9-14. (Scopus)
17. Jeyalakshmi R, Sivasakthi M, Revathi T, Rajamane N P, "Fire Related Temperature Resistance of Fly Ash Based Geopolymer Mortar" MATEC Web of Conferences 97, 01034 (2017) DOI: 10.1051/mateconf/20179701034.(Scopus, DOAJ).
- 18.Revathi, Jeyalakshmi Sivasakthi, Rajamane, Dhinesh "Studies on Physio Chemical Properties of Fly Ash for their Effective Alkali Activation" SOJ Materials Science & Engineering, 2016.
19. R. Biju Bennie, S. Theodore David, M. Sivasakthi et al., "Synthesis, Spectral Characterization and Antimicrobial Studies of Schiff base Transition Metal Complexes derived from Cuminaldehyde and 4-Aminoantipyrine", Chemical Science Transactions, 2014,3(3).

Books Published

Rajamane N P, Mohd Mustafa Al Bakri Abdullah, Sivasakthi M, Indu Puthalath, Sodium hydroxide solutions for geopolymer technology, Rajamane Science and Technology Publications, Karnataka, India. ASIN:B09KS1RFP2. 31, October, 2021.

Accomplishments

- ▽ Key note speaker in the 3 days online Faculty Development Program titled "Future of Construction Technology and Green Buildings" from 02.07.2020 to 04.07.2020 organized by the Department of Civil Engineering, CMR Institute of Technology, Bengaluru-37.
- ▽ Key note speaker in the UGC sponsored "National Seminar on Green Chemistry, An Outlook" in POPE'S college (Autonomous), Sawyerpuram. (23rd & 24th March 2018)
- ▽ Organised the one day workshop on Introduction to Geopolymer Composites Technology in SRM University (23rd July 2016) and given a lecture in the topic of "Characterization of Geopolymer Matrix Using Analytical Methods.
- ▽ Associated as a member of Staff Development Committee.
- ▽ Associated in the work of the NAAC visit, NBA, ABET and ISO

Funded Projects

- ▽ SERB Power Grant – Budget 29.65 Lakhs

Achievements and Awards

- ▽ Secured 38th ranking in the CSIR-National Eligibility Test

- ▽ Ranked at the 95.5 percentile in the all India graduate aptitude test of engineering (GATE), 2014.
- ▽ Secured 2nd Rank in M.Sc at University Level 2011
- ▽ Secured 2nd Rank in B.Sc at College Level 2009
- ▽ Best Paper Award - National Level seminar Organized in M.D.T Hindu College 2013
- ▽ Best Paper Award "First Prize" - National Seminar for Research Scholars at AMC Engineering College, Bangalore – 2017.
- ▽ Best paper award in the International conference held in Hindustan Institute of Science and technology 2021.

Paper Presentation in National/International Level Conferences

- ▽ No of papers presented in international conference – 15
- ▽ No of papers presented in national conference – 14
- ▽ Workshops participated – 7
- ▽ Seminars participated – 4
- ▽ Webinars attended – 19
- ▽ FDP attended – 5

Skills

Handling thermal analysis instrument TGA/DTA, thermal expansion and thermal conductivity
Analytical skill for SEM, XRD, XPS, MAS-NMR, FT-IR results of cementitious and geopolymeric materials

Membership in professional bodies

Member, American Chemical Society