

Curriculum Vitae

1. **Name:** Sebastian C Peter
2. **Gender:** Male
3. **Date of Birth:** 03-April-1978
4. **E-mail ID:** sebastiancp@gmail.com; sebastiancp@incasr.ac.in
5. **Qualifications:**

S.No.	Degree	Institution	Year	Division/Class
1	PhD	University of Münster, Germany	2003-2006	Suma Cum Lauda
2	M.Tech.	Cochin University of Science & Technology, India	2000-2002	First Class with distinction
3	M.Sc.	St. Thomas College, Calicut University, India	1998-2000	First Class
4	B.Sc.	St. Thomas College, Calicut University, India	1995-1998	First Class with distinction

6. Employment Experience

S.No.	Position & Organisation	Nature of job	Period
1	Associate Professor, Jawaharlal Nehru Centre for Advanced Scientific Research	Leading a research group in the area of	2017-till date
2	Assistant Professor, Jawaharlal Nehru Centre for Advanced Scientific Research		2014-2017
3	Ramanujan Fellow, Jawaharlal Nehru Centre for Advanced Scientific Research		2010-2014
4	Post Doctoral Fellow, Northwestern University, USA	R&D	2008-2010
5	Post Doctoral Fellow, Max Plank Institute for Chemical Physics of Solids, Dresden, Germany	R&D	2007-2008
6	Research Associate, University of Münster, Germany	R&D	2006-2007

7. Selected List of Ten Best Publications.

1. Reduction of CO₂ to Chemicals and Fuels: A Solution to Global Warming and Energy Crisis. **Peter, S. C.** *ACS Energy Lett.* 2018, 3, 1557-1561 (Impact Factor – 19.003).
2. Thermochemical CO₂ Hydrogenation to Single Carbon Products: Scientific and Technological Challenges, Roy, S. Cherevotan, A. R.; **Peter, S. C.** *ACS Energy Lett.*, 2018, 3, 1938-1966 (Impact Factor – 19.003)
3. Operando Generated Ordered Heterogeneous Catalyst for the Selective Conversion of CO₂ to Methanol. Cherevotan, A.; Raj, J.; Dheer, L.; Roy, S.; Sarkar, S.; Das, R.; Vinod, C. P.; Xu, S.; Wells, P.; Waghmare, U. W.; **Peter, S. C.** *ACS Energy Lett.* 2021, 6, 509-516 (Impact Factor – 19.003).
4. CO₂ capture and sequestration - A solution for enhanced recoveries of unconventional gases and liquids. Gupta, R.; **Peter, S. C.** *Energy and Climate Change*, 2020, 1, 100003.
5. "Inverse Strain Effect in Atomic Scale" - Enhanced Hydrogen Evolution Activity and Durability in Cu substituted Palladseite. Sarma, S. C.; Ann Mary, K A; Roy, S. **Peter, S. C.** *ACS Energy Lett.* 2018, 3, 3008–3014. (Impact Factor – 19.003)
6. Evolution of Dealloyed PdBi₂ Nanoparticles as Electrocatalysts with Enhanced Activity and Remarkable Durability in Hydrogen Evolution Reaction. Sarkar, S.; Subbarao, U.; Peter, S. C. *J. Mater. Chem. A* **2017**, 5, 15950-15960. (Impact Factor: 11.301)
7. Electrochemical Dealloying of PdCu₃ Nanoparticles to Achieve Pt-like Activity for the Hydrogen Evolution Reaction. Jana, R.; Bhim, A.; Bothra, P.; Pati, S. K.; Peter, S. C. *Chem Sus Chem*, **2016**, 9, 1. (Impact Factor: 7.962)

8. Sarkar, S.; Ramarao, S. D.; Das, T.; Das, R.; Vinod, C. P.; Chakraborty, S.; Peter, S. C. Stress Induced Electronic Structure Modulation of Mn-incorporated Ni₂P Leading to Enhanced Activity for Water-Splitting. *ACS Catal.* **2021**, *11*, 800-808 (Impact Factor: 4.473).
9. Deconvolution of phase–size–strain effects in metal carbide nanocrystals for enhanced hydrogen evolution. Roy, S.; Bagchi, D.; Vemuri, V.; Sarma, S.C.; Ahuja, V.; Rajaji, V.; Narayana, C.; Peter, S.C. *Nanoscale* 2020, *12*, 15414-15425 (Impact Factor: 6.895).
10. Anomalous thermal expansion in the square-net compounds RE₄TGe₈ (RE = Yb, Gd; T = Cr–Ni, Ag). Peter, S. C.; Chondroudi, M.; Malliakas, C. D.; Balasubramanian, M.; Kanatzidis, M. G. *J. Am. Chem. Soc.* 2011, *133*, 13840 (Impact Factor: 14.612).

11. Patents filed/ Granted with Details.

- a. Methods and compositions for the detection of X-ray and γ -ray radiation, US Patent, (2012), US 8,519,347 B2.
- b. A method of synthesizing intermetallic compounds and applications thereof, (2019) WO2015011680A1.
- c. Shape tailored ordered PdCu₃ nanoparticle surpassing the activity of state-of-the-art fuel cell catalyst. PCT Application No: PCT/IN2018/050167 and INDIAN Application no. 201741010595.
- d. Highly stable and durable metal chalcogenide based catalyst for oxygen reduction reaction. PCT Application No: PCT/IN2018/050168 and INDIAN Application no. 201741010611.
- e. Catalyst, its process of preparation, and applications towards reduction of carbon dioxide to chemicals. Provisional Application No.:201841045187

12. Books Published/Chapters contributed.

1. Thermochemical CO₂ Reduction in Advances In The Chemistry And Physics Of Materials: Overview Of Selected Topics. Roy, S.; Peter, S. C. 2019, 399, Publisher, World Scientific

13. Sponsored Research Projects

(a) Projects completed

S.No.	Title	Sponsoring Agency and Officer Concerned	Period	Amount	Achievements
1	Structure-property relations in RE based intermetallic compounds	DST Ramanujan fellowship	16-09-2010 to 15-09-2015	77,00,000	
2	Rare earth doped chalcogenide glasses for optical and photonic applications.	DST Fast Track	10-05-2012 to 09-05-2016	24,56,400	
3	Structure-Property relations in RE ₂ TGe ₃ (RE =rare earths; T =transition metals) compounds	UGC-DAE CSR	15-03-2012 to 31-12-2016	7,64,266	
4	Structure-property relations in RE ₂ TGe ₃ (RE = rare earths; T = transition metals) compounds	CSIR	01-10-2014 to 31-03-2018	19,53,000	
5	Structure and physical properties of Yb based indides (in collaboration with Prof. Dr. Barbara Albert, TU Darmstadt, Germany)	DST-DAAD	06-07-2016 to 05-07-2018	4,46,000	
6	Energy school on clean and renewable energy technologies via chemical route	DST, I2CAM, SSL, JNCASR	27-11-2017	20,00,000	

7	Electrochemical routes for energy conversion, storage and fuel production	Bhaba Newton Fund and SSL	10-12-2018	10,94,000	
8	Investigation on the Structure-Property relations in Novel Europium based Intermetallic compounds (in collaboration with Prof. Dr. Dariusz Kaczorowski, Polish Academy of Sciences, Wrocław, Poland)	DST-Poland	28-06-2017 to 31-12-2019	13,58,000	
9	Studies on the topological insulator behaviour in heavy metal based ternary chalcogenides (in collaboration with Dr. Marie-Aude Méasson Université Paris Diderot-Paris7)	DST-CEFIPRA	20-11-2016 to 31-03-2020	73,00,000	
10	Device Fabrication of Efficient non-Pt based Ordered Intermetallic Nanoparticles as Electrode Materials for Fuel Cell Green Energy Production	TRC	22-11-2016 to 31-01-2020	69,13,360	
11	Industry Sacle CO ₂ Reduction from Coal Power Plant Flue Stream to Produce Methanol and Other High Value Fuels	TRC	21-06-2019 to 31-03-2020	1,20,00,000	

(b) Projects ongoing

S.No	Title	Sponsoring Agency and Officer Concerned	Period	Amount	Achievements
1	Non-Pt based Alloys and Intermetallics as Efficient Electrode materials for the Energy conversion in Fuel cell	DST/SERB	24 -09-2019 to 23 -09-2022	35,02,828	
2	Development of Integrated technologies for reduction of anthropogenic/industrial waste CO ₂ to value added chemicals and fuels	Mission Innovation	30-09-2019 to 29-09-2022	3,24,31,920	
3	Development of novel catalyst for photocatalytic CO ₂ reduction using sunlight	Mission Innovation	15-11-2019 to 15-11-2022	87,13,526	
4	Development of Integrated technologies for conversion of Anthropogenic CO ₂ to MeOH and value-added chemicals	Swarnajayanti Fellowship	01-08-2019 to 31-07-2024	2,48,34,960	
5	Conversion of anthropogenic carbon dioxide into useful chemicals/fuels and water to hydrogen using sunlight	DST-UKEIRI	Yet to be Scheduled	20,00,000 (proposed)	

Consultancy Projects: **None**

a. Sponsored Research/Consultancy Projects submitted for approval:

S.No.	Title	Funding Agency	Duration	Amount

14. Awards and Honours:

National list:

- a) DST Swarnajayanti Fellowship (2018)
- b) Materials Research Society of India (MRSI) medal (2016)
- c) Indian National Young Academic of Sciences (INYAS) Membership (2016-2020)
- d) Ramanujan Fellowship, DST, India (2010-2014).
- e) Council of Scientific & Industrial Research and National Eligibility Test (2001).
- f) External member in the Board of Sciences of St. Joseph College, Bengaluru.
- g) Executive committee member in the Catalysis Research of India, Bangalore Chapter.
- h) Doctoral Advisory Committee member of Poornaprajna Institute of Scientific Research (PPISR), Bengaluru, India.
- i) Expert member of the Selection Committee of Technology Mission Division of Department of Science and Technology, India.

International list:

- a) Emerging Investigator by Royal Chemistry Society (RSC) (2016).
- b) Emerging Young Investigator in the field of solid-state chemistry by the American Chemical Society (2014).
- c) Emerging Investigator in Material Science by Institute of Physics (IOP) (2016)
- d) Editorial board member of Journal of Solid State Chemistry (Since 2016 December)
- e) Member of the Royal Society of Chemistry (MRSC)-2016.
- f) Int. Graduate School of Chemistry fellowship, University of Münster, Germany (2003-06).
- g) Lead the team "Breathe Applied Sciences Pvt Ltd" enters into the final round of NRG COSIA carbon XPRIZE global competition prize worth 20M USD. BREATHE is the only Indian team in the final out of total 10.

15. Technologies Developed / Transferred: (Please provide details of technologies transferred to industry, technology commercialized)

- a) Generated 5 patents in the area of new materials, fuel cells and CO₂ reduction.
- b) Developed an integrated solution for the conversion of anthropogenic (waste) CO₂ into methanol and other value added products.
- c) Founded a Start-up venture "Breathe Applied Sciences Pvt Ltd" having the mission of converting waste CO₂ into fuels and chemicals.
- d) Led the team BREATHE Applied Sciences Pvt Ltd in the NRG COSIA carbon XPRIZE global competition prize worth 20M USD on the subject Carbon utilization, and entered into the final round. BREATHE is the only team from India in the final round of the competition.
- e) Developed a 300 kg CO₂/day to methanol conversion facility at JNCASR.
- f) Breathe has been awarded as one of the top 100 start-ups by Karnataka State Government through a programme called ELEVATE 100 in 2017.
- g) Developed non-Pt based catalysts as efficient electrode materials with activity and durability on par with the state-of-the-art material Pt/C for fuel cells.
- h) Developed single cell fuel cell (PEM, DMFC and FAFC) station facility at JNCASR.



Sebastian C. Peter