Sundaresan C

Work : Aqueous corrosion laboratory, Indian Institute of Technology Bombay, Powai, 400076, Mumbai, India

Email: csundar92@gmail.com **Phone:** (+91) 8056475713 **Google Scholar:** C. Sundaresan

Gender: Male **Date of birth:** 10/06/1992 **Nationality:** Indian

RESEARCH INTERESTS

High temperature corrosion of Stainless steels, Ni-base superalloys & AM alloys| Oxidation in Advanced Ultra-supercritical steam| Hot corrosion| Thermal spray coatings| Aqueous corrosion| Material degradation at high temperature

EDUCATION

[2020 – 2025] **Ph.D. (Submitted, defending in a month)**

'Understanding the Oxidation Behaviour of Austenitic Stainless Steels 304HCu and Sanicro 25 in Advanced Ultra-Supercritical Steam'

Supervisors: Prof. V.S. Raja & Prof. Vijayshankar Dandapani

Metallurgical Engineering & Materials Science Department, Indian Institute of Technology Bombay

[2018 – 2020] **M.Tech. by Research**

'A Comparative study of Hot Corrosion Behaviour of Thermal spray coatings on T91 Boiler Steel'

CGPA: 9.71/10, Materials Engineering, National Institute of Technology Karnataka

[2010 – 2015] **Bachelor of Engineering**

CGPA: 8.38/10

Production Engineering, PSG College of Technology, Coimbatore

PUBLICATIONS

[2025] **Sanicro 25 in Advanced Ultra-Supercritical (AUSC) steam: Oxidation behaviour of a high strength, heat-resistant austenitic stainless steel for high-efficiency coal-fired power plants**

Reference: C. Sundaresan, B. Ghule, K. Chattopadhyay, V.S. Raja, Corrosion Science 250 (2025) 112878

[2024] **Oxidation behaviour of austenitic stainless steel 304HCu in Advanced Ultra Supercritical (AUSC) steam and the efficacy of shot-peening treatment**

Reference: C. Sundaresan, B. Ghule, H.C. Dey, S. Ningshen, D. Vijayshankar, V.S. Raja, Corrosion Science 235 (2024) 112214

[2023] **Oxidation behaviour of Ni-base superalloy 617 in simulated Advanced Ultra Supercritical (AUSC) steam**

Reference: B. Ghule, C. Sundaresan, S. Ningshen, V.S. Raja, Corrosion Science 224 (2023) 111503

[2022] **Oxidation Behaviour of Ni-base superalloys in supercritical water – A Review**

Reference: B. Ghule, C. Sundaresan, Dandapani Vijayshankar, and V.S. Raja., Journal of the Indian Institute of Science 102 (2022) 351–389

[2021] **Comparative hot corrosion performance of APS and Detonation sprayed CoCrAlY, NiCoCrAlY and NiCr coatings on T91 boiler steel**

Reference: C. Sundaresan, B. Rajasekaran, S. Varalakshmi, K. Santhy, D.S. Rao and G. Sivakumar., Corrosion Science 189 (2021) 109556

MANUSCRIPTS (YET TO BE PUBLISHED)

Alloy 304HCu in AUSC steam: Exploring the early oxidation mechanism, oxide scale structure & the effect of steam pressure

C. Sundaresan, B. Ghule, D. Vijayshankar, V.S. Raja (2025), (Under review with Corrosion Science)

Wrought Vs Selective Laser Melted stainless steel 316L: Comparative oxidation behaviour in high temperature air and Advanced Ultra Supercritical steam environments

C. Sundaresan, B. Ghule, V.S. Raja (2025)

SELECTED PRESENTATIONS

EuroCorr 2023, Brussels, Belgium

C. Sundaresan, Bhagwat Ghule, S. Ningshen, Dandapani Vijayshankar, V.S. Raja*, "Oxidation Behaviour of Austenitic Stainless Steel 304HCu in Advanced Ultra Supercritical Steam"*

22nd International Corrosion Congress 2024, Xi'an, China

C. Sundaresan, Bhagwat Ghule, Dandapani Vijayshankar, V.S. Raja, "*Sanicro 25: A promising austenitic stainless steel alloy for Advanced Ultra Supercritical Steam oxidation environments*"

2025 High Temperature Corrosion Gordon Research Seminar & Conference, New London, United States

C. Sundaresan, Bhagwat Ghule, Dandapani Vijayshankar, V.S. Raja "Alloy 304HCu and Sanicro 25: Tale of the oxidation behaviours of two heat-resistant stainless steels in Advanced Ultra-Supercritical (AUSC) steam" (Poster)

RESEARCH PROJECTS

[2020 – 2025] **Oxidation behaviour of Austenitic stainless steels & Ni-base superalloys in an Advanced Ultra-supercritical steam environment**

- Research Scholar at IIT Bombay
- An AUSC steam oxidation test loop with controlled feedwater chemistry was used
- Tests were conducted at 650-710 ℃, 31 MPa
- Stainless steels 304HCu, Shot-peened 304HCu, Sanicro 25, SLM 316L & Ni-base superalloys 617, 740H were studied

[2018 – 2020] **Hot corrosion behaviour of thermal spray coatings for AUSC boiler applications**

- Project student at ARCI, Hyderabad
- Plasma & detonation sprayed NiCr, CoCrAlY and NiCoCrAlY bond coats on T91 steel were tested for hot corrosion

TECHNICAL SKILLS

Characterization techniques

- Electron microscopy (SEM & TEM), EBSD, Atom probe tomography (APT), Raman & FTIR spectroscopy, X-ray diffraction, Nano-indentation
- Electrochemical characterization: PDP, EIS, Mott-Schottky analysis

Systems & Equipments

- High-temperature & High-pressure systems, Water conditioning units, Associated units
- Plasma & detonation thermal spray coating systems

AFFILIATIONS & AWARDS

[2015 – 2016] **Senior Executive, Hyundai Motor India Ltd., Chennai**

[2021 – 2025] **Treasurer, AMPP India Student chapter-IIT Bombay**

[2023 – Current] **Peer review activity (Corrosion Science journal)**

[2022] **AMPP NACE Foundations India Scholarship, Issued by Corcon Institute of corrosion**

[2022] **AMPP Graduate student book award**

[2025] **International Travel grant from 'Anusandhan National Research Foundation', ANRF India**