C.N.R. Rao, Contribution, Achievements, Invention, Awards

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Professor C.N.R. Rao is a world-renowned scientist in **Solid State Chemistry and Materials Science.**He has made seminal contributions to chemical spectroscopy, molecular structure, surface chemistry, and high-temperature superconductivity.**C.N.R. Rao** also brought a lot of visibility to science in India and has been an inspirational figure for aspiring scientists. He has built some of the country's best science departments or transformed them under his leadership. More recently, his interest has shifted to **nanosciences and nanotechnology.**

C.N.R. Rao Early Life and Career

Dr. Chintamani Nagesa Ramachandra Rao was born in **Bangalore** on June 30, 1934. He obtained a B.Sc. degree from the University of Mysore in 1951 and an M.Sc. from **Banaras Hindu University** in 1953.

- He began as a lecturer at the **Indian Institute of Science in 1959**.
- **IIT Kanpur:** He headed the Department of Chemistry and later became **Dean of Research.**

- In 1976, C.N.R. Rao returned to IISc to establish the Solid State and Structural Chemistry Unit as well as the Materials Research Laboratory.
- At his initiative, the Government of India established the **Jawaharlal Nehru Centre for Advanced Scientific Research** in 1989.
    - Professor Rao was the founder and president of the Center.

C.N.R. Rao Contributions

Professor C.N.R. Rao's research focused on the use of spectroscopic methods to study **molecular structure.** He studied many **chemically significant problems using** electronic and vibrational spectroscopy, such as spectra-structural correlations, environmental effects, vibration analysis, and so on.

C.N.R. Rao Contribution to Chemistry

C.N.R. Rao concentrated his research in **solid state and structural chemistry** on the development of novel synthetic methods and structures, electron transport, magnetic properties, and defects in ionic solids.

- He has investigated the **structure-property relationships** in complex solids using a variety of modern investigation tools.
- His research has resulted in the development of unified models for the behaviour of a wide range of compounds, such as **metal oxides and sulfides.**
- **Nano Chemistry:** His work on **inorganic nanotubes** and different types of carbon nanotube structures is regarded as an excellent contribution to nanochemistry, which made him a great exponent of nanoscience.
    - A wide range of nanoparticles and nanoparticle assemblies have been synthesized and characterised in his laboratory, and new phenomena have been discovered.
        - It was discovered that nanoscale metal oxides and nitrides exhibit **magnetism** at room temperature due to surface effects.
    - **Nano Science and Technology Initiative (NSTI):** It was launched in 2001 by the Department of Science and Technology under the leadership of **CNR Rao.**

C.N.R. Rao Achievements

C.N.R. Rao is the recipient of **several honorary doctorate degrees and awards from** Indian and foreign universities, has published a large number of research articles, and has written many books.

- Presently, he is also a member of the editorial boards of a large number of prestigious **international journals** dealing with chemical physics, spectroscopy, solid state, and material chemistry.

Important Positions in National and International Bodies

- Chairman, Science Advisory Council to the Prime Minister
- Chairman, National Nano Initiative, Government of India
- Founder-President of Chemical Research Society of India and Materials Research Society of India
- Chairman, Indo-Brazil and Indo-Japan Science Council

- Vice-President, International Organization of Chemistry for Development
- President of Indian National Science Academy and Indian Science
- Director, Reserve Bank of India.

Publications

In the world of research and academia, Prof. C.N.R. Rao is an internationally acclaimed personality.

- Published around 1550 research articles.
- 46 books on spectroscopy, solid state and material chemistry, superconductivity, nanochemistry, and various other subjects.
- Autobiography: Climbing the limitless ladders of a life in chemistry.

Honours

Prof. C.N.R. Rao has received a large number of awards, which includes:

- Marlow Medal of Farady Society (1967)
- Bhatnagar Prize (1968)
- Padma Shri (1974), Padma Vibhushan (1985), and Bharat Ratna (2014)
- Einstein Gold Medal of UNESCO (1996)
- Centenary Medal of the Royal Society of Chemistry, London (2000)
- First recipient of the Indian Science Award of the Government of India (2005)
- The Royal Medal of the Royal Society of Chemistry (2009)
- The August-Wilhelm-von-Hoffmann Medal of the German Chemical Society (2010).
