

## B. C. Subba Rao (1923–2017)

B. C. Subba Rao, former scientist at the National Chemical Laboratory (NCL), Pune and Hindustan Uniliver Ltd, Mumbai passed away on 9 August 2017 at his residence in Mysore.

Subba Rao was born to B. C. Chennakshavaiah and Gangamma on 8 December 1923 in Mysore. He completed his education till M Sc from Mysore city. Subba Rao had an outstanding academic record, he was school first in SSLC (1939); obtained merit scholarship in Intermediate course (1941); secured first class, first rank in B Sc (1944) and distinction in M Sc (1946). Later, he worked as a Lecturer in Chemistry in the University of Mysore (1944–46) and then as a Research Assistant in the Department of Chemistry, Indian Institute of Science (IISc), Bangalore (1947–51). Subsequently, he served as a Lecturer in the Department of Chemistry at Indian Institute of Technology, Kharagpur (1951–52).

In 1952, Subba Rao went to Purdue University, USA to join the research group of Herbert C. Brown (1912–2004) for his Ph D. He was awarded the Ph D degree in 1955 for his outstanding work on the application of  $\text{NaBH}_4$  for the reduction of organic compounds. Subba Rao continued to work in Purdue University for two more years (1955–1957) under the guidance of Brown as a postdoctoral fellow on the application of this fascinating  $\text{NaBH}_4$  reagent discovered by Brown himself during his postdoctoral studies under his mentor H. I. Schlesinger.

Subba Rao returned to India in 1958 and joined NCL as Senior Scientific Officer. He briefly worked on the application of  $\text{NaBH}_4$  in organic transformations with a gift sample provided by Brown. Later, he switched over to other problems of national importance, such as industrial uses of cashew nut shell oil, terpenes, etc.

Subsequently, Subba Rao took up the post of Director of Research and Development, M/s HICO Products Ltd, Bombay. In the true spirit of a passionate

scientist, when he moved to HICO, he picked up the surfactants and emulsifiers chemistry with ease. At that time, HICO was in the forefront of manufacturing such chemicals, as a part of India's drive to indigenize bulk and specialty chemicals



technologies. After serving for three years at HICO, Subba Rao joined Hindustan Lever Research Limited, Mumbai in 1967 as the Divisional Manager, Chemistry Division.

One of us (S.U.K.) remembers Subba Rao's visit to Purdue University in 1978, when Mrs and Dr Rao spent a couple of days with the Browns. Later, upon returning to India in June 1982, S.U.K. took up a job at Unilever (then called Hindustan Lever) where Subba Rao was the Head of the Chemical Sciences Group. It did not take much time to gather that Subba Rao was a master of many research fields, a lively person, with lots of energy and enthusiasm. However, he took early retirement to spend more time with family.

Subba Rao's research contributions go far beyond boron chemistry, surfactants, terpenes, etc. covering oils and fats, soaps and detergents, perfumery chemicals, and so on. In recognition of his outstanding contribution in chemical research, Subba Rao was elected to the Fellowship of the Indian Academy of Sciences, Bengaluru in 1975.

The hydroboration reaction was discovered during Subba Rao's postdoctoral studies with Brown on  $\text{AlCl}_3$  catalysis of  $\text{NaBH}_4$  reductions. Brown's research group made enormous contributions to organoboranes – involving many co-workers, including E. Negishi and A. Suzuki (2010 Chemistry Nobel laureates) and many Indian co-workers including M. V. Bhatt (1924–2016), who was also a colleague of Subba Rao at IISc, during 1947–51, for which Brown was awarded the Nobel Prize in Chemistry in 1979.

Needless to say, Brown was always fond of Subba Rao and India, and hence had a large contingent of Indian students in his research group (15 Indians out of a total of 22 co-workers in our years at Purdue University; S.U.K. 1973–81 and M.P. 1979–82). We fondly remember Brown's appreciation of Subba Rao's contributions to boron chemistry during the Monday group meetings.

It is noteworthy to mention here that C. N. R. Rao knew Subba Rao very well. When C. N. R. Rao joined Purdue University for his Ph D degree, Subba Rao was in the final stages of his research work. In fact, they had shared an apartment for about a year. According to C. N. R. Rao, Subba Rao was a good friend and a wonderful person.

Subba Rao and his outstanding contributions to chemistry and Indian industry will remain in our memory for long.

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