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ORIGINAL CONTRIBUTION

Acharya Prafulla Chandra Ray:-Master of Nitrites in chemical world

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Abstract: Acharya Prafulla Chandra Ray, the torch bearer of Indian Science was spread his life and activities almost in every section of science. His teaching life in Prestigious Presidency college and afterward then newly established Calcutta University, amalgamated with teaching and research works which were quite unfamiliar in British colonial India. It was most interesting that, through his academia; Ray touches Nation's life for her proper regeneration and uplift. Besides his multithreaded endeavour, this work fully concentrated upon his chemical researches which were mostly bounded upon the Nitrites groups and judging the honour 'Master of Nitrites' being compatible before him.

KEYWORDS— Acharya Prafulla Chandra Ray, Chemical research, Master of Nitrites, Legacy

1. INTRODUCTION

Acharya Prafulla Chandra Ray, the indigenous product of national science was glorified his mother land through multithreaded endeavour in his ever active life. He was a most rare quality scientist who not bound himself into the small cage of laboratory but spread him in favour of humanity. Before him humanity was urgent and for the sake of that, Ray organized all his achievements towards that divine destination. The leading spirit of world of science, Ray actually has excelled his career for sanctifying science by perfect synchronization of science and humanity. Besides his diversified personality, this study fully reveals Ray's research works which were mostly bound in the arena of Nitrites compositions and judging the honour 'Master of Nitrites' by renowned scientist Prof. Henry E. Armstrong LL.D., Ph.D., F.R.C.S., London before him.

But before it, the sketch of life of such doyen may require for said purpose. Acharya Ray was born in a lovely and prosperous village in the district Jessore (now in Bangladesh), on 2nd August, 1861. In 1879, Prafulla Chandra passed entrance examination and was admitted to the Metropolitan Institute. At that time Ray was also an external student of the Presidency College where he attended the lecture of Sir John Elliott

in physics and of Sir Alexander Pedler in chemistry and inclined towards science. In that mean while, he got the prestigious Gilchrist Fellowship and went to Edinburg University where he completed his B.Sc. Degree successfully. After that Ray was awarded Doctorate in Science (D.Sc.). In that occasion Ray was writing an essay 'India before and after mutiny'. (Chakrabarti, D. 2005) In 1888 he returned to India and after he joined at Presidency College as an Assistant professor in Chemistry Department. Then besides of his teaching he continued his research work in chemistry along with his fellow students. The most remarkable research work had done by him to discover Mercurous Nitrite (yellow crystalline deposit) which was before known as unstable. This thesis was published in Journal of Asiatic Society of Bengal and honoured and congratulation letter given by eminent chemist like Bertheldt, Roscal, Victor Mayer and many others.

There had been an uninterrupted flow of scientific papers numbering 160 up to the year 1939 which were published nationally and internationally in the Journal of the Chemical Society (London), Zeitschrift anorg amische and allge merie, Nature, Journal of the Indian chemical society and few others. (Chakrabarti, S.

2009) In his so long 52yrs contribution in research, Ray acclaimed high profile of gratitude from the different end of the world and the journey which started at the age of 27yrs was reached its highest level of altitude when Ray honoured by Master of Nitrites. The world class chemist Prof. Armstrong was first used this title in favour of him and expressed "The way in which you have gradually made yourself 'master of nitrites' is very interesting and the fact that you have established that as a class they are far from being the unstable bodies, chemist had supposed, as an important addition to our knowledge". (Bhattercharya, A. 2012 pp.132) Afterword the world of science was also given her gratification before that legend.

Findings:-

The investigator fined after a long literature of survey that Ray's number of research papers on Nitrites group are 78 out of his total number of research works 160. Chronological list of research publication on Nitrites composition are given as:-

1. Roy, P. C. (1896). On Mercurous Nitrite. Journal of the Asiatic Society of Bengal (JASB), 65, 1-9.
2. Roy, P. C. (1896). Mercury Hyponitrites. Proceedings of Chemical Society, 12, 217-218.
3. Roy, P. C. (1896). The interaction of Mercurous Nitrite and the Alkyl Iodides. Proceedings of Chemical Society, 12, 218.
4. Roy, P. C. (1896). Uber Mercuronitrit. Zeitschrift anorg amische and allge merie, 12, 365-374.
5. Roy, P. C. (1897). The nitrites of Mercury and the varying condition under which they are formed. Journal of Chemical Society (JCS), 71, 337-344.
6. Roy, P. C. (1897). Mercury Hyponitrites. Journal of Chemical Society (JCS), 71, 348-350.
7. Roy, P. C. (1897). On the action of Sodium Hyponitrite on Mercuric Solutions. Journal of Chemical Society (JCS), 71, 1097-1104.
8. Roy, P. C. (1897). On a new method of preparing Mercuric Hyponitrite. Journal of Chemical Society (JCS), 71, 1105-1106.
9. Roy, P. C. (1899). On the interaction of Mercurous and marcuric Nitrites with the Nitrites of Silver and Sodium. Proceedings of Chemical Society, 15, 103.
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19. Roy, P. C. (1905). The Nitrites of the Alkali metals and the metals of alkaline earths and their decomposition by heat. Journal of Chemical Society (JCS), 87, 177-184.
20. Roy, P. C. & Ganguli, A. C. (1905). The constitution of Nitrites, Part I. Two varieties of Silver Nitrites. Proceedings of Chemical Society, 22, 278.

21. Roy, P. C. (1906). Fischer's salt and its decomposition by heat. *Journal of Chemical Society (JCS)*, 89, 551-556.
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23. Roy, P. C. & Ganguli, A. C. (1907). The Decomposition of Mercurous and Silver Hyponitrites by heat. *Journal of Chemical Society (JCS)*, 91, 1399-1403.
24. Roy, P. C. (1907). Mercurous Hyponitrite. *Journal of Chemical Society (JCS)*, 91, 1404-1405.
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27. Roy, P. C. (1907). The Double Nitrites of Mercury and the Alkali metals. *Journal of Chemical Society (JCS)*, 91, 2031-2033.
28. Roy, P. C. (1907). Silver Mercurous-Mercuric Oxynitrates and the isomorphous replacement of univalent Mercury by Silver. *Journal of Chemical Society (JCS)*, 91, 2033-2037.
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(Chakraborty, S. 2009 & Chakrabarti, A. & Chakrabarti, B. 2015).

In his broad area of research, Prafulla Chandra fully concentrated nearly half portion of his research on Nitrites compositions and obviously a major part of those findings were in collaboration with his beloved pupils such as Mr. Atul Chandra Ganguli, Mr. Panchanan Neogi, Mr. Jitendra Nath Rakshit, Mr. Nilratan Dhar, Mr. Rasik Lal Datta, Mr. Prafulla Chandra Guha and many more. (*Mandal, N. 2011*). As an ardent lover of ancient and modern literature including science from his early age, Prafulla Chandra acknowledged with the utility of the Mercury in medicinal field and later when he devoted himself into the ocean of research, he directed himself into that said field. At that time Calomel (Mercurous Chloride) was a most popular medicine for treat Cholera, Malaria, Yellow Fever etc. and Prafulla Chandra attracted that zone due to his inherent drive towards Mercury. For the preparation of Calomel, Mercurous Nitrate was necessary as a reagent and "During a preparation of mercurous nitrate by the action of nitric acid (dilute) in the cold on mercury, yellow crystals are deposited, which on examination, prove to be mercurous nitrite". (*Mandal, N. 2011 pp.127*) Accidental discovery of that such compound, turned Ray's mode of research in that such unknown area and "After the discovery of mercurous nitrite, he began investigation on various nitrites (including double nitrites with mercuric) of alkaline earths, nitrites of mercury-alkyl and -aryl ammonium series, ammonium nitrites and nitrous acid". (*Palit, C. & Das, C. 2007 pp.32*) Following the way Prafulla Chandra became a legendary specialist in that abstract chemical enquiry field as well as imbibed the mentality of such type's of research into his fellow student's whole heartedly.

2. CONCLUSIONS

The most important contribution of Prafulla Chandra in science was that he, the first Indian who makes science as swadeshi (national) and fights against with tremendous odds by foreign rulers. The way as he was lived and the way as he was practiced were fused into an architectural unity where each and every stages touches the ultimate reality. And the achievements, in

direction of that such specialized research field; basically an integral part of Ray's devotion in favour of sanctifying science. (*Lourdsamy, J. 2004*) Depending upon such faith and observing Ray's intellectual ascendency along with his fellow students, Prof. Armstrong was crowned him as Master of Nitrites which paved the way for honour 'Father of Modern Indian Chemistry' afterword and made him immortal.

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