**GOVERNMENT OF INDIA**
**MINISTRY OF SCIENCE AND TECHNOLOGY**
**DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH**

**LOK SABHA**
**UNSTARRED QUESTION No. 2508**
**(TO BE ANSWERED ON 01.08.2018)**

**EMISSION OF NANO CARBON PARTICLES**

**2508. SHRIMATI PRATYUSHA RAJESHWARI SINGH:**

**Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:**

(a) whether the Government is aware of a study which revealed that the CNG buses emit nano carbon particles which can cause cancer;
(b) if so, the details thereof; and
(c) the remedial measures taken/to be taken by the Government in this regard?

**ANSWER**
**MINISTER OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES**
**(DR. HARSH VARDHAN)**

(a) Yes, Madam. CSIR-Indian Institute of Petroleum (CSIR-IIP), Dehradun in collaboration with University of Alberta, Canada in 2011-2012 conducted a study on 2 CNG and 2 Diesel buses on road to measure the particulate emissions under real world driving conditions.

(b) Both CNG buses as well as one diesel bus were tested in Calgary, Canada while the second diesel bus was tested in Dehradun, India. The results of this study were published (Ref: Proceedings of the 8th International Conference on Internal Combustion Engines 2014, ICICE8-A-11-655-1). It was seen that the CNG buses produce about 200 times less particles than diesel buses not equipped with a Diesel Particulate Filter (DPF) while they produce 35 times more particles than the diesel bus equipped with Diesel Particulate Filter (DPF). The toxicity study of particles emitted by diesel or CNG buses was not conducted and no comments can thus be offered on their health impacts including cancer.

Third party documents in public domain (Annexure-I) suggest that toxicity of particles emitted by diesel or CNG vehicles need to be evaluated depending on a number of factors such as, but not limited to, the source fuel quality, engine characteristics and driving conditions.

(c) No toxic study on particulate emissions to understand the health impacts was conducted by CSIR-Indian Institute of Petroleum (CSIR-IIP), Dehradun. The Ministry of Road Transport & Highways (MoRTH) has been putting in place from time to time, the desired interventions to control vehicular pollution.

**Annexure-I**


1. Norman Y. Kado, et. al., "Emissions of Toxic Pollutants from Compressed Natural Gas and Low Sulfur Diesel-Fueled Heavy-Duty Transit Buses Tested over Multiple Driving Cycles", Environ. Sci. Technol., 2005, 39 (19), pp 7638–7649.

2. Liisa Pirjola, et. al., "Physical and Chemical Characterization of Real-World Particle Number and Mass Emissions from City Buses in Finland",Environ. Sci. Technol., 2016, 50 (1), pp 294–304.

3. Pratim Biswas, et. al., "Nanoparticles and the Environment", Journal of the Air & Waste Management, Vol. 55, 2005, Issue 6, pages 708-746.

4. Britt A. Holmen, et. al., "Ultrafine PM Emissions from Natural Gas, Oxidation-Catalyst Diesel, and Particle-Trap Diesel Heavy-Duty Transit Buses", *Environ. Sci. Technol.*, 2002, 36 (23), pp 5041–5050.

5. Antonietta Zoroddu, et. al., "Toxicity of Nanoparticles", Current Medicinal Chemistry, Volume 21, Number 33, November 2014, pp. 3837-3853(17).


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