ABSTRACT

The environmental pollution is one of the major strategic questions for decision makers both in industry as well as in government. The use of petrol and petroleum products in the automobile industry is well known and the emission from them is also well known. More stringent emission standards are being introduced all over the world with the aim of progressively reducing vehicular emission leading research to achieve Low Emission Vehicle (LEV), Ultra Low Emission Vehicle (ULEV) and Zero Emission Vehicle (ZEV).

In achieving the LEV and ULEV, the after treatment of exhaust gases such as catalytic converter plays an important role. New catalytic converters attain maximum conversion rates of about 80-90% under optimum operating conditions but it is not effective during cold start conditions. Two factors contribute to the high emission at cold start are the catalyst does not begin to oxidize HC and CO until it reaches light off temperature and engines run with a rich mixture during warm-up. Approximately 60 percent of the overall HC and CO emissions are emitted during the first 180 seconds from the cold-start period. One strategy to control the cold start emission is the use of an Electrically Heated Catalyst (EHC).

In this investigation an attempt is made to study the cold start emission from Spark Ignition engine using Electrically Heated Catalyst in combination with conventional catalytic converter. The experiments have been conducted in two different configurations (EHC-MC and EHC-LOC-MC) with copper oxide and silver oxide as
catalyst in EHC and Light off Converter (LOC) with and without air supply under 1 and 1.5 kW heating for EHC. The commercially available catalytic converter is used as Main Converter (MC). It is found that the EHC reduces cold start emission in both configurations and more reduction is achieved in EHC-LOC-MC configuration with copper oxide as catalyst under 1.5 kW heating with air supply.