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Home > Volume 13, Issue 4, December 2012 > **Nagini**

Comparative Studies on Emissions of Four Stroke Copper Coated Spark Ignition Engine with Catalytic Converter with Different Catalysts with Gasohol

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Abstract

Experiments were carried out to study the exhaust emissions of variable speed, variable compression ratio, four- stroke, single cylinder, spark ignition (SI) engine having copper coated engine [CCE, copper-(thickness, 300 μ) coated on piston crown and inner side of cylinder head] provided with catalytic converter with different catalysts of sponge iron and manganese ore with different test fuels of pure gasoline and gasohol (80% gasoline and 20% ethanol by volume) and compared with conventional engine (CE) with pure gasoline operation. Exhaust emissions of carbon monoxide (CO) and un-burnt hydro carbon (UBHC) were varied with different values of brake mean effective pressure (BMEP), speed, compression ratio with different operating conditions of catalytic converter with different catalyst. Aldehyde emissions were measured at peak load operation. CO and UBHC were measured with Netel Chromatograph CO/UBHC analyzer. The engine was provided with catalytic converter with sponge iron and manganese ore as catalysts. There was provision for injection of air into the catalytic converter. The performance of the catalyst was compared with one over the other. Gasohol operation on CCE decreased exhaust emissions effectively in comparison with pure gasoline operation on CE. Catalytic converter with air injection significantly reduced pollutants with different test fuels on both configurations of the engine.

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