

# Study of Ethanol-Camphor Mixture as an Alternative of Conventional Liquid Engine Fuel

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## Abstract

With the limited stock of liquid engine fossil fuels petrol and diesel available for automobile and mechanical industries, there is continues demand to use alternative sources. In view of this need, a study using ethanol-camphor mixtures was carried out to study its suitability an alternative of conventional liquid engine fuel. For this purpose, petrol, diesel, ethanol, ethanol-camphor (9:1), ethanol-camphor (8:2) and ethanol-camphor (7:3) were compared on various parameters. All the fuels under study were burned in an open flame system and flame temperature, duration of burning, flash point and density was determined. With this study it can be concluded that ethanol-camphor mixture can be used as alternative for conventional liquid fuel.

## Introduction

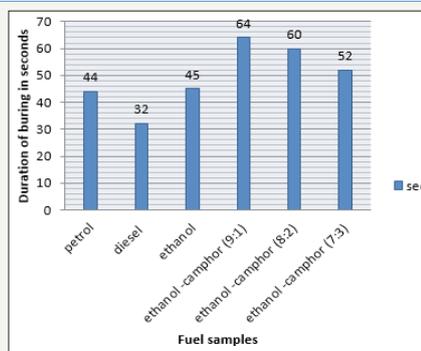
Present research work is based on the study of ethanol-camphor as an alternative fuel, as we all know that fuel is important component in automobile and mechanical field, in India use of alternative fuel is limited as it is not cost effective. Ethanol and camphor is cheap and easily available as compared to petrol and other alternative fuel, so the problem of pollution is solved. The main aim of this study is to study the suitability of ethanol-camphor as an alternative eco-friendly fuel that is cheaper and easily available as compared to petrol and diesel. We succeeded in our experiments and observed that the mixture of ethanol and camphor is burns with blue flame and no by-product is left after burning [1]. This use of volatile-sublime mixture as fuel is first time tested by us in India, the results of the study are suggesting that with the use of such fuels we can increase the efficiency of engine. It can not only used in engine but also in generator or any other object to produce energy in form of heat energy. In automobile sector requirement of heat energy is very important and we know heat is produced by burning any component, but 100% heat is not possible. Because after burning some waste and by product are left and some vaporized in smoke.

## Material and Methods

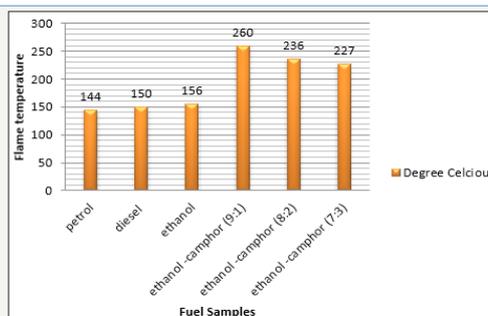
Detailed study of literature was done to study the various properties of liquid engine fuel. Various properties of ethanol-camphor mixture were calculated to compare with the properties of petrol, diesel and ethanol. The petrol and diesel for the study were collected from HP petrol depot; ethanol used was obtained from Merk India Ltd. and camphor from CDH India [2]. All fuel samples were burned in an open flame system and during this combustion process, temperature of flame, duration of burning and flash point was determined. The density of sample fuel was also determined to

study the physical property of fuel. Three different composition of ethanol-camphor 9:1, 8:2 and 7:3 was prepared to determine the exact mixture that can be effectively used in combustion [3].

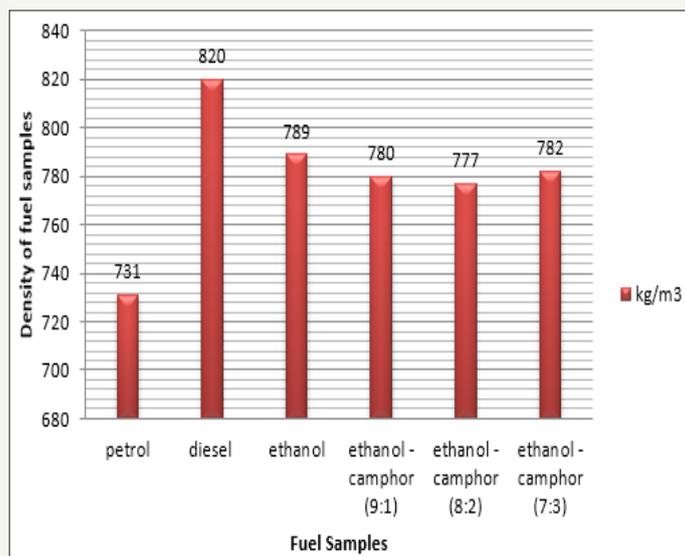
## Result and Discussion



**Figure 1:** Duration of burning of petrol, diesel, ethanol, ethanol-camphor (9:1), ethanol-camphor (8:2) and ethanol-camphor (7:3) in open flame system.



**Figure 2:** Flame temperature of petrol, diesel, ethanol, ethanol-camphor (9:1), ethanol-camphor (8:2) and ethanol-camphor (7:3) in open flame system.



**Figure 3:** Density of petrol, diesel, ethanol, ethanol-camphor (9:1), ethanol-camphor (8:2) and ethanol-camphor (7:3) at 35 °C.

Figure 1-3.

### Conclusion and Suggestion

The result of the present study suggests that the ethanol-camphor mixture can be used as an alternative of conventional liquid engine fuel. It is a cheap and eco-friendly approach towards discovery of new fuels for engine. This study suggests that other volatile-sublime compounds can be tested for their efficiency as an engine fuel [4].

### References

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