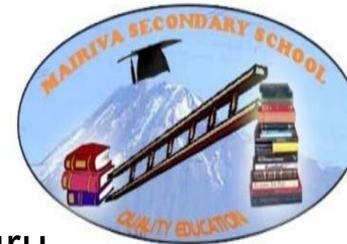




A Water Based Stove



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Introduction:

In Tanzania the use of charcoal is the traditional method for cooking. The production of charcoal can damage the environment so we designed an alternative stove using oil and water as the fuel source.

In this project we attempt to build a stove using oil and water as the fuel source



Attempting to mix oil and water can sound strange. In fact these liquids DO NOT mix which leads to the impressive reaction we obtain. In this stove we use waste oil which is FREE and is a by product of the ??? industry. A controlled flow is directed into the 'reaction chamber' as shown in Fig.1 and is ignited. The ignition is above 100°. Water drops are then added. As the liquids do not mix, the water drops sinks into the oil where it is rapidly boiled and vapourised creating the explosion of burning oil we see.

The challenge in this project is to control the rate of explosion and control the release of fumes .

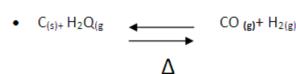
Methods:

The stove consists of the following parts:

- Reaction chamber
- Fume chamber
- Outlet
- Outer chamber
- Oil & water funnels
- Oil and water storage
- Hot plate

THEORY

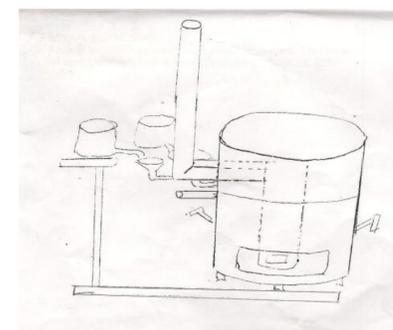
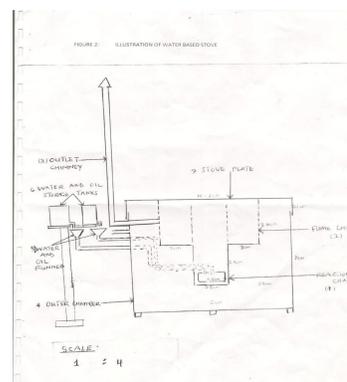
- Used motor oil is a Mixture of high molecular hydrocarbon and amorphous carbon (soot), due to incomplete combustion in the internal combustion engine.
- The burning temperature of this oil is about 100°C this temperature is sufficient to convert the soot and water vapour into water gas: the reaction is:



At that temperature water gas combines with atmosphere oxygen to give an explosion.



- This explosion gives a lot of energy and the cycle repeats. Once the stove has ignited it is difficult to control in a small scale, but industrially a mechanism can be designed:



WATER BASED STOVE MECHANISM (METHODS)

A controlled waste oil volume is allowed to flow through oil pipe into "reaction chamber" whereby it is ignited to boiling point. Which is above 100°C.

Water drops are then allowed to flow into the "reaction chamber" which boils quickly and react with the boiling oil, leading to explosion.

HINT: Since the boiling point of oil is above 100°C then in contact with water drops. Water vapour will be formed at once and sinks down into the oil, creating explosion

The explosion fumes rise up into "Fume chamber" where by oxygen from inlet holes increases combustion creating large heat energy at the "Stove plate" The fumes are exhausted to outflow through a barrel connected to the chimney.



Conclusions:

The use of waste oil by burning with water creates heat energy which may be used for domestic purpose. Also the use of oil is an advantage to the environment by reducing pollution.

Generally the use of both waste and water lead to the cheapest alternative source of energy in Tanzania which can be afforded by any Tanzanian.

For further more designs an incinerator can be made for burning dry or wet waste (waste Materials) from schools, homes, industries etc due to high temperature created by the stove.

Nevertheless, an oven can be designed and placed (fixed) on the stove plate. The future plan of our project is to modify the water based stove for multi purpose uses.

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Further information:

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