

Carbonite

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Abstract: To explore the possibilities of using tar as a binder for producing charcoal Fireballs (pellets).

Background: After a period of considerable research two references to a fuel called Carbonite was discovered. One source was "Hydrogen Generator Gas For Vehicles and Engines, Volume 1 & 2" page 42 & 43 Volume 2. The other source was "Producer Gas For Motor Vehicles" pages 36 & 37.

Both sources claim that the specific gravity of the fuel is greater than one and it doesn't absorb water. It is a very durable fuel that doesn't break when violently thrown on a cement floor. The volume of Carbonite is $\frac{1}{4}$ that of charcoal and quite reactive. It uses the condensable off gas' for the binder thus more efficient than just charcoal. I did find another reference to Carbonite but it was not this type of product.

One difficulty is that this was a project that was done about two years ago and I didn't have the time to document the experiments or research on curing tar. In other words there are gaps in this report.

First Experiment: Dissolve some tar in denatured alcohol and use this liquid as the binder for ball agglomerating. Some tar was placed in a glass container with alcohol then heated in a microwave oven. After removing from the oven the mixture was stirred. Because of a lack of time no attempt to measure the percentage of tar was performed. A small quantity of switch grass charcoal was reduced in a kitchen blender. In Photo 1 you will find the agglomerations formed in a rotating drum. The formed agglomerations can be seen in Photo 2, below.



Photo 2

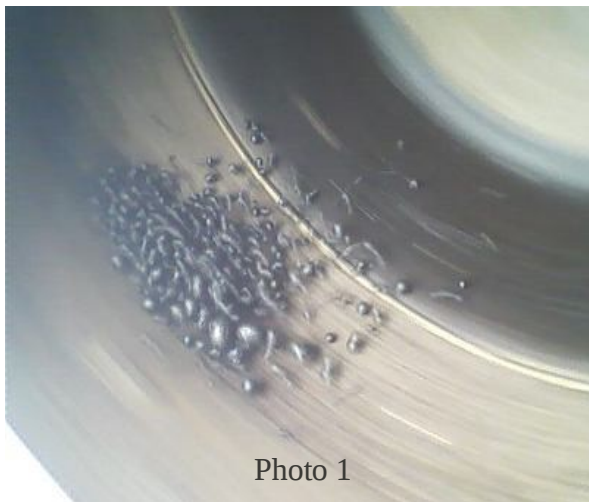


Photo 1

Unfortunately the Fireballs/agglomerations were very fragile as can be seen below in Photo 3.



Photo 3

Second Experiment: The next group of experiments was to increase the percentage of tar dissolved in the denatured alcohol. To save time the agglomerations were formed by hand.



Photo 4

Above in Photo 4 are the drying agglomerations. When dried the tar was cured enough to handle the agglomerations at room temperature. The tar

before this curing could not be handled without leaving a large residue on ones hands. Unfortunately above room temperature they became sticky. There was an attempt to oven cure them at 150 F with no success. Because of a lack of time the percentage of tar was not measured.

Third Experiment: The next generation of experiments used lime, found in the garden section of a department store, and heat. This combination does indeed cure tar. In a test tube tar was heated then lime was added. This combination turned to a rock like substance rather fast. I don't remember the details but the next technique, judging from Photo 5 was to mix lime into the switch grass charcoal. Next tar was mixed in by hand (with gloves).



Photo 5

I do not recall if I heated the tar in order to mix it into the powder or if it was all heated together and then mixed. Photo 6 shows what equipment was used in these experiments.

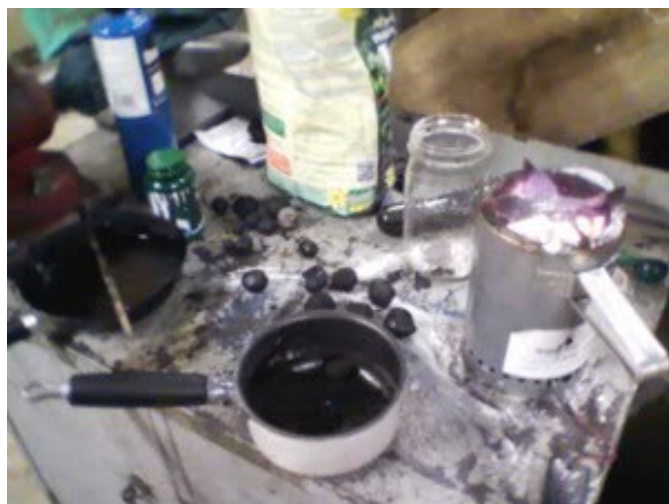


Photo 6



Photo 7

Fourth Experiment: With the aid of a hydraulic press and a home made form (cylinder and piston) there was an attempt to produce a pressed agglomeration. Somehow the tar was mixed with the switch grass charcoal and placed into the form. With this process there was a tendency to press out or separate the tar from the charcoal.

Observations: One problem is the overwhelming stench of the tar. It's amazing how a small pellet can produce such a large odor! One solution to this might be the temperature that the tar is formed at. Possibly this is why the above sources mentioned that it is possible to store Carbonite under water.

In photo 7 there are five agglomerations labeled:

- 1 - (tar + charcoal)(solvent cured ethanol)
- 2 - (tar + charcoal)(pressed)
- 3 - (tar + charcoal)
- 4 - (tar)(lime cured)
- 5 - (tar + charcoal)(lime cured)