UTAH BIODIESEL SUPPLY

Testing Methods For Biodiesel

Testing Starting Oil

1 – Test for Water Content

A- Hot Pan Test (Biodieseltutorial.com)
B- Quantitative Water Test (Biodieseltutorial.com)
C- Water Test Kit (utahbio.com)

2- Test for Free Fatty Acid

A- Go/No Go Test (utahbio.com)
B- Titration Kit (utahbio.com)
C- Really Expensive Stuff (SafTester) (utahbio.com)

Testing Finished (Pre-Washed) Biodiesel

1- Testing for Conversion

A- 3/27 Methanol Test (Biodieseltutorial.com)
B- ASTM Total & Free Glycerin Test (Utahbio.com)
C- SafTest Unit (Utahbio.com)

2- Test for Soap

A- Shake-Em Up Test (Biodieseltutorial.com)
B- Soap Titration Test (Biodieseltutorial.com)

Testing Finished (Washed) Biodiesel

1- Testing for Conversion

A- 3/27 Methanol Test (Biodieseltutorial.com)
B- ASTM Total & Free Glycerin Test (Utahbio.com)
C- SafTest Unit (Utahbio.com)

2- Test for Reaction

A- Shake-Em Up Test
B- Soap Titration Test

Testing Methanol

1- Hydrometer

RESOURCES:

Utah Biodiesel Supply – http://www.utahbio.com
Collaborative Tutorial – http://www.biodieseltutorial.com

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Titrating Used Oil For FFA% Content

The Basic Method

Items Needed

- 1 Pint of Isopropyl Alcohol (the higher the % purity the better)
- 1 Liter of distilled water
- 1 Gram of Catalyst (either NaOH or KOH-should be the same as what you'll make your biodiesel with)
- 3 Small Cups
- 3-4 Small Syringes
- Ph Indicator (Phenol Red, Phenolphthalein, or Turmeric Powder)
- Sample of oil to titrate
- Calculator & some paper

Make Titration Solution

1- Add 1 Gram "Catalyst" to 1 liter distilled water
2- Mark as POISONOUS!!!

Prepare Titration

1- Add 10 mL Isopropyl Alcohol to titration cup
2- Add 1-2 drops of pH Indicator
3- Add small amount "titration solution" to "blank the titration"
4- Add 1 mL Oil Sample to titration cup
5- Dissolve Oil & Alcohol (heat can be your friend)

Perform Actual Titration

1- Fill second cup with 30 mL Titration Solution
2- Fill a syringe with 10 mL Titration Solution
3- Add 1 mL Titration Solution to Titration Cup & watch for color change
4- Repeat adding Titration Solution until color changes & stays changed for 30 seconds or more
5- Record amount of solution used to change color

Calculating Catalyst Required

X = Amount of solution used in mL
7 = KOH as catalyst
5.5 = NaOH as catalyst
O = Oil to be converted in liters

Formula:

If using NaOH for catalyst
(7 + X) * O = Total Grams of Catalyst to use

Helpful Information:

3.87 liters to 1 gallon

Example:

Using a KOH solution, it took 5 mL titration solution to turn the indicator
We have 40 gallons of oil we want to convert to Biodiesel

A) 40 gal * 3.87 = 155 liters
B) 155 Liters X .20 = 31 liters of methanol
C) 5 + 7 = 12 grams (So for every liter of oil, we'll use 12 grams of KOH)
D) 155 X 12 = 1860 grams

So, to make this into Biodiesel…..

155 liters of oil
31 liters of methanol
1860 grams of KOH
Heat, Stir, Let Settle & Wash

Additional Resources:

Murphys Machines – http://www.murphysmachines.com
Utah Biodiesel Supply – http://www.utahbiodieselsupply.com/tutorialvideos.php
Collaborative Tutorial – http://www.biodieseltutorial (then click on Titrating Oil)