THERMOCHEMISTRY UNIT/BIODIESEL PREPARATION QUIZ

ANSWER EACH QUESTION IN THE SPACES BELOW.

1. DESCRIBE THE TRANSESTERIFICATION REACTION THAT PRODUCES BIODIESEL. INCLUDE THE REACTANTS, PRODUCTS AND WHAT PROCEDURES ARE USED TO IMPROVE THE RATE OF REACTION.

TRANSESTERIFICATION IS THE REACTION BETWEEN SOME TRIGLYCERIDE (VEGETABLE OIL, CANOLA OIL, SUNFLOWER OIL, ETC.) AND METHANOL. THESE ARE THE REACTANTS. THE PRODUCTS ARE GLYCEROL AND BIODIESEL. THE REACTION RATE IS INCREASED BY USING THE CATALYST KOH. A CATALYST SPEEDS UP A REACTION BY LOWERING THE ACTIVATION ENERGY REQUIRED. ALSO, THE REACTION IS HEATED AND STIRRED TO INCREASE THE RATE.

1. FROM YOUR READING AND RESEARCH, LIST TWO ADVANTAGES AND TWO DISADVANTAGES OF USING BIODIESEL AS A FUEL. YOU MAY INCLUDE ECONOMIC, HEALTH OR ENVIRONMENTAL COMMENTS.

STUDENT ANSWERS WILL VARY. ADVANTAGES MAY INCLUDE

* CAN BE USED IN EXISTING DIESEL ENGINES
* REDUCES AIR POLLUTION GASES
* PRODUCES LESS CARBON DIOXIDE THAN PETROLEUM FUELS
* USES EXISTING MATERIALS FOR REACTANTS
* REDUCES U.S. DEPENDENCE ON FOREIGN OIL

DISADVANTAGES MAY INCLUDE

* EXPENSIVE
* NOT A LOT OF SELLERS IN OUR AREA
* CAN’T BE USED DURING COLD WEATHER
* LESS FUEL ECONOMY AND POWER
* OIL INDUSTRY WORKERS WILL LOSE THEIR JOBS
* USING CROPS TO MAKE FUEL WILL DEPLETE FOOD SUPPLIES

1. WHAT IS THE PURPOSE OF USING THE KOH IN THE REACTION BETWEEN YOUR VEGETABLE OIL AND THE METHANOL?

KOH IS A CATALYST. A CATALYST SPEEDS UP A REACTION BY LOWERING THE ACTIVATION ENERGY REQUIRED. IT IS NOT USED UP AND CONVERTED INTO A PRODUCT.

1. NAME AT LEAST TWO WAYS THAT THE CATAWBA COUNTY ECOCOMPLEX AND LANDFILL SITE IS BEING ENVIRONMENTALLY FRIENDLY.

STUDENT ANSWERS WILL VARY BUT MAY INCLUDE

* USING LANDFILL LAND TO GROW CROPS FOR FUEL
* MAKING FUEL ON SITE TO USE IN LANDFILL TRUCKS
* MAKING THEIR OWN HEAT AND ELECTRICITY ON SITE
* SELLING THE SEED MATERIAL FOR ANIMAL FOOD
* CONDUCTING EMISSIONS TESTING ON BIODIESEL FOR CONSUMERS
* USING METHANE FROM THE LANDFILL FOR HOMES IN THE COUNTY

1. WHAT DOES THE TERM “B-20” REPRESENT?

B-20 IS A BLEND OF 20% BIODIESEL WITH 80% REGULAR PETROLEUM FUEL.