

# ALCHEM

P. O. Box 426 / Ruston, LA 71273-0426 / Office 318-243-1181 / Fax 318-255-7190

**Mr. Gerald Brent**  
General Manager  
U.S.S.E.C.  
500 Industrial Street  
Port Gibson, MS 39150

Dear Jerry:

The gas from the transformation of soybeans to bio-fuel is not natural gas. First let us review my background for making the following proof I am an Assistant Professor of Physical Science and hold Masters of Science in Chemistry my work experience began in 1980 with the natural gas industry with Aeropres Corporation and my work continues to this day with the petroleum industry for further details please see my curriculum vita.

## Natural Gas

Nitrogen	2%
Methane	90%
Carbon Dioxide	2%
Ethane	5%
Propane	0.5%
Isobutane	0.1%
n-Butane	0.1%
Isopentane	0.1%
n-Pentane	0.1%
Hexanes	0.1%
Other Alkanes	0.1%
Alkenes	0%

## Soy Gas

Hydrogen	7%
Methane	10%
Carbon Dioxide	8%
Ethane	8%
Propane	8%
Isobutane	8%
n-Butane	8%
Isopentane	7%
n-Pentane	7%
Hexanes	7%
Other Alkanes	0%
Alkenes	22%

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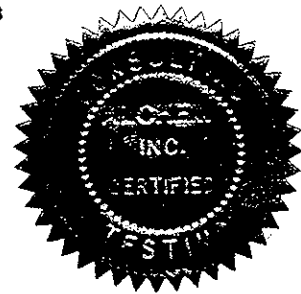
COMPANY : U.S.S.E.C. REPORT : 01/09/2006  
 STATION # : Soybean Run SAMPLED : 01/06/2006  
 REFERENCE : Gerald Brent ANALYZED : 01/07/2006  
 SAMPLE NAME : 20# of Beans CONDITIONS : atm & amb

TEST FREQUENCY : Spot H2S BY STAIN : not given  
 COMPONENTS METHOD# MOLE% LIQ.VOL.% WEIGHT%

COMPONENTS	METHOD#	MOLE%	LIQ.VOL.%	WEIGHT%
Hydrogen	D-1945-81	7.391	2.815	0.341
Nitrogen	D-1945-81	0.000	0.000	0.000
Methane	D-1945-81	7.868	5.651	2.890
Carbon Monoxide	D-1945-81	10.462	4.984	6.709
CO2	D-1945-81	7.442	5.375	7.499
Ethane	D-1945-81	7.620	8.636	5.246
UnI Hydrocarbons	D-1945-81	15.165	8.657	11.833
Propane	D-1945-81	7.733	9.030	7.807
Isobutane	D-1945-81	7.220	10.009	9.608
n-Butane	D-1945-81	7.317	9.776	9.737
Isopentane	D-1945-81	7.205	11.172	11.902
n-Pentane	D-1945-81	7.264	11.149	11.999
Hexanes+	D-1945-81	7.313	12.745	14.429
=====				
Totals	METHOD#	100.000	100.000	100.000

MOLECULAR WEIGHT = 43.677  
 ISENTROPIC FACTOR, k @ 14.696psia & 60°F = 1.1436  
 MOLAR MASS RATIO @ 14.696psia & 60°F = 1.50807  
 HEATING VALUE BTUGI/DSCF @ 14.696psia & 60°F = 1904.47  
 HEATING VALUE BTUGI/DSCF @ 14.73 psia & 60°F = 1908.88  
 HEATING VALUE BTUNI/DSCF @ 14.696psia & 60°F = 1811.42  
 Density pounds/cu.ft. @ 14.696psia & 60°F = 0.07563  
 VISCOSITY centipoise (g) | @ 14.696psia & 60°F = 0.00908  
 SPECIFIC HEAT BTU/lbm\*°F @ 14.696psia & 60°F = 0.36204  
 COMPRESSIBILITY FACTOR @ 14.696psia & 60°F = 0.97566  
 HEATING VALUE BTUGI/lbm @ 14.696psia & 60°F = 25,181

*Buddy G. Barnett*  
 Buddy Glen Barnett



Natural gas contains exclusively alkanes which are saturated hydrocarbons that have a general formula of  $C_nH_{2n+2}$ . The alkenes are unsaturated hydrocarbon molecules having a general formula of  $C_nH_{2n}$ .

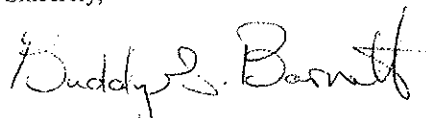
The alkanes require more oxygen per mole when being oxidized than hydrogen require in combustion. During combustion of alkanes carbon dioxide is formed where as in hydrogen's combustion only water is formed.

The alkenes have many more uses in chemical industry due to the ability to react with other compounds thus they are good starting materials for the production of plastics; e.g., poly ethylene from ethylene (two carbon alkene), poly propylene from propylene (three carbon alkene)

The only thing soy gas and natural gas have in common is that they are both gases at room temperature and atmospheric pressure. This fact can be questioned since soy gas has high percentages of liquefiable hydrocarbon gases such as propane which has the physical property at 110 pounds per square inch and 70 degrees F, isobutane at 31 pounds per inch squared and 70 degrees F, n-butane at 17 pounds per inch squared and 70 degrees F and the heavier alkanes at 14.7 pounds per square inch and 70 degree are all liquids.

Please contact me at 318 243-1181, or [alchem@cox-internet.com](mailto:alchem@cox-internet.com) for additional information.

Sincerely,



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