



Sample Matrix: Gas
Sample Type: Spot
Preservative: N/A
Sample Container: 1626

Method(s): ASTM D 5443
Multi-Isomer analysis by Gas
Chromatography

Lab #: 2510-170912K003
Quality Control Report: 4847

Client: Kinder Morgan
Project Location: Dolores, Co.
Sample Id.: DC13 Wellhead
Sample Temp.: 82°F
Atmospheric Temp.: 90°F
Pressure: 643 psig
Field Data: N/A
Sample Date: 9/08/17
Time: 12:00
Sampled By: Rick
Analysis Date: 9/21/17
Analysis By: Jana Spence

Analytical Results

<u>Gas Composition</u>		
	<u>Mol %</u>	<u>GPM</u>
Nitrogen (N2):	3.8284	0.4210
Carbon Dioxide (CO2):	94.9844	16.2025
<u>Hydrocarbon Composition</u>	<u>Mol %</u>	<u>GPM</u>
Methane (CH4):	1.0825	0.1834
Ethane (C2H6):	0.0395	0.0106
Propane (C3H8):	0.0165	0.0045
Iso-Butane (C4H10):	0.0096	0.0031
N-Butane (C4H10):	0.0101	0.0032
Iso-Pentane (C5H12):	0.0062	0.0023
N-Pentane (C5H12):	0.0065	0.0023
Hexane+ (C6H14):	0.0165	0.0072
Totals	100.0000	16.8400

Comments - Additional Data

BTU -dry (BTU/ft3):	14.1	Z-Comp. Factor-dry:	0.99479
BTU -water vapor sat.(BTU/ft3):	14.9	Z-Comp. Factor-water vapor sat.:	0.98149
Specific Gravity -dry:	1.4949	14.65 psi Pressure Base	
Specific Gravity-water vapor sat.:	1.5152		

*See Next Page for Compositional breakdown of C6+ Fractions



2510-170912K003– DC13 Wellhead

Analytical Results

<u>C6+ Fractions Composition</u>		
<u>Hexane Isomers (C6's)</u>		<u>Mol %</u>
2,2-dimethylbutane	P	0.0000
2,3-dimethylbutane	PN	0.0001
2-methylpentane	P	0.0016
3-methylpentane	P	0.0007
methylcyclopentane	N	0.0012
benzene	A	0.0000
cyclohexane	N	0.0009
n-hexane	P	0.0060
<u>Heptane Isomers (C7's)</u>		
2,2-dimethylpentane	P	0.0001
2,4-dimethylpentane		0.0001
3-methylhexane	P	0.0003
1,t3-dimethylcyclopentane	N	0.0000
1,c3-dimethylcyclopentane	N	0.0000
1,t2-dimethylcyclopentane	N	0.0000
toluene	A	0.0002
methylcyclohexane	N	0.0017
ethylcyclopentane	N	0.0000
n-heptane	P	0.0027
<u>Octane Isomers (C8's)</u>		
2,4 + 2,5-dimethylhexane	P	0.0000
1,t2,c4-trimethylcyclopentane	N	0.0000
1,t2,c3-trimethylcyclopentane	N	0.0000
2-methylheptane	P	0.0001
1,c2,t4-trimethylcyclopentane	N	0.0000
3-methylheptane	P	0.0001
1,c3-dimethylcyclohexane	N	0.0000
1,t4-dimethylcyclohexane	N	0.0000
methyl-ethylcyclopentanes	N	0.0000
1,c4 & 1,t3-dimethylcyclohexane	N	0.0000
1,c2-dimethylcyclohexane	N	0.0000
ethylcyclohexane	N	0.0000
ethylbenzene	A	0.0000
m + p-xylene	A	0.0000
o-xylene	A	0.0000
n-octane	P	0.0004

2510-170912K003– DC13 Wellhead

<u>C6+ Fractions Composition (cont.)</u>		
<u>Nonane Isomers (C9's)</u>		Mol %
trimethylhexanes	P	0.0000
dimethylheptanes	P	0.0000
isopropylcyclopentane	N	0.0000
n-propylcyclopentane	N	0.0000
3-methyloctane	P	0.0000
trimethylcyclohexanes	N	0.0000
isopropylbenzene	A	0.0000
isopropylcyclohexane	N	0.0000
n-propylcyclohexane	N	0.0000
n-propylbenzene	A	0.0000
m-ethyltoluene	A	0.0000
p-ethyltoluene	A	0.0000
1,3,5-trimethylbenzene + 4&5-methylnonane	A/P	0.0000
o-ethyltoluene + 3-methylnonane	A/P	0.0000
1,2,3-trimethylbenzene	A	0.0000
n-nonane	P	0.0001
<u>Decane Isomers (C10's)</u>		
2-methylnonane	P	0.0000
tert-butylbenzene	A	0.0000
1,2,4-trimethylbenzene	A	0.0000
Isobutylcyclohexane + t-butylcyclohexane	N	0.0000
isobutylbenzene	A	0.0000
sec-butylbenzene	A	0.0000
n-butylcyclohexane	N	0.0000
1,3-diethylbenzene	A	0.0000
1,2-diethylbenzene + n-butylbenzene	A	0.0000
1,4-diethylbenzene	A	0.0000
n-decane	P	0.0000
unidentified C9 naphthenes + C10 paraffins		0.0000
unidentified C10 aromatics + C11 paraffins		0.0000
Ungrouped C10's		0.0000
<u>Undecane Isomers (C11's)</u>		
n-undecane	P	0.0000
<u>Dodecane Isomers (C12's)</u>		
isododecane +	P	0.0000

Comments - Additional Data

A – Aromatic (Ring Hydrocarbons), N – Naphthene (Cyclic Paraffins & Alkanes), P – Paraffin (Alkanes)



2510-170912K003– DC13 Wellhead

Gas Composition		
	<u>ppm vol.</u>	<u>Grains/100 ft³</u>
Hydrogen Sulfide	0.29	0.019
Carbonyl Sulfide	0.11	0.007
Methyl Mercaptan	0.26	0.016
Ethyl Mercaptan	0.04	0.002
Dimethyl Sulfide	0.06	0.004
Carbon Disulfide	0.00	0.000
2-Propanethiol	0.00	0.000
Tert-butyl Mercaptan	0.05	0.003
1-Propanethiol	0.01	0.000
Thiophene	0.00	0.000
N-Butanethiol+Diethyl Sulfide	0.01	0.001
Methyl Ethyl Sulfide	0.00	0.000
2-Methyl-1-Propanethiol	0.01	0.001
1-Methyl-1-Propanethiol	0.02	0.001
Total Sulfur	0.87	0.055