

Lab #: 746631 Job #: 43749 IS-94649 Co. Job#:
 Sample Name: Kats 31-34 / Production Casing Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: W45121
 Formation:
 Sampling Point: 337
 Date Sampled: 12/10/2019 8:20 Date Received: 12/16/2019 Date Reported: 1/23/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0065			
Hydrogen -----	0.0285			
Argon -----	0.0131			
Oxygen -----	0.25			
Nitrogen -----	1.15			
Carbon Dioxide -----	1.38	2.6		
Methane -----	66.44	-48.4	-253	
Ethane -----	15.59	-33.1		
Ethylene -----	nd			
Propane -----	8.79	-29.6		
Propylene -----	nd			
Iso-butane -----	1.31	-31.8		
N-butane -----	3.08	-28.8		
Iso-pentane -----	0.747	-28.8		
N-pentane -----	0.798	-28.4		
Hexanes + -----	0.414			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1402

Specific gravity, calculated: 0.838

Remarks: Isotopes obtained online via GC-C-IRMS/GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.

Lab #: 746632 Job #: 43749 IS-94649 Co. Job#:
 Sample Name: Kats 31-34 / Surface Casing Co. Lab#:
 Company: Crestone Peak Resources
 API/Well:
 Container: IsoTube®
 Field/Site Name: Bradenhead Testing
 Location: W45121
 Formation:
 Sampling Point: 337
 Date Sampled: 12/10/2019 8:16 Date Received: 12/16/2019 Date Reported: 1/23/2020

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	δD ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	0.0247			
Hydrogen -----	0.0104			
Argon -----	0.140			
Oxygen -----	3.27			
Nitrogen -----	12.97			
Carbon Dioxide -----	0.016			
Methane -----	68.05	-51.7	-251	
Ethane -----	7.75	-34.8		
Ethylene -----	nd			
Propane -----	5.08	-30.3		
Propylene -----	nd			
Iso-butane -----	0.646	-32.2		
N-butane -----	1.40	-29.3		
Iso-pentane -----	0.287	-28.6		
N-pentane -----	0.257	-28.4		
Hexanes + -----	0.0944			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 1050

Specific gravity, calculated: 0.756

Remarks: Insufficient CO2 concentration for isotopic analysis. Isotopes obtained online via GC-C-IRMS/GC-P-IRMS.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. All gas component carbon isotope values are reported on a scale defined by a two point calibration of LSVEC and NBS 19. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.