

Note- fumaroles sampled in 2006 were smaller and cooler than those visited in 1994. In 2006, an avalanche from Sherman Peak blocked access to the largest ones in the east breach.

Analyses by Bill Evans, USGS. Published references and sample location descriptions are below.

	1994		1996	1997		2006*	
	Smiley	N. Wall	Smiley	Smiley	MB-1	MB-2	MB-3
	Mt. Baker	Mt. Baker	Mt. Baker	Mt. Baker	Mt. Baker	Mt. Baker	Mt. Baker
collection date	19940610	19940906	19960823	19970807	20060822	20060822	20060822
T(C)	135	150	137	134.4	90	91	91
Analysis date: 20060919							
vol-%							
He					0.0010	0.0008	0.0007
H2					0.4180	0.9080	0.0745
Ar					0.0768	0.0299	0.8170
O2					1.6900	0.6160	18.0000
N2					6.9600	2.8200	67.4000
CH4					0.6570	0.6890	0.0941
CO2					88.6000	91.7000	12.3000
C2H6					0.0001	0.0002	<0.0002
H2S					3.0300	3.4600	<0.0005
CO					<0.001	<0.001	<0.001
C3H8					<0.0005	<0.0005	<0.0005
C4H10					<0.0005	<0.0005	<0.0005
Sum					101.4000	100.2000	98.7000
N2/Ar					90.7	94.3	82.5
air-cor.					517.1	214.0	29.4
N2/O2					4.11	4.58	3.75
t(D'A,P)					221	242	na
CO2 term					1	1	na
d13C-CO2					-6.7	-6.7	
d13C-CH4							
3He/4He (Rc/Ra)	7.42	7.49	7.45	7.7	7.36	7.31	
normalized							
vol-%							
He	0.0006	0.0009	0.0007	0.0011	0.0010	0.0008	0.0007
H2	0.3100	0.2900	na	0.2500	0.4118	0.9063	0.0755
Ar	0.0013	0.0016	0.0014	0.0012	0.0757	0.0299	0.8284
O2	<0.0005	<0.002	0.0006	0.0100	1.6698	0.6149	18.2003
N2	0.5400	0.5900	0.4700	1.0600	6.8657	2.8172	68.3414
CH4	0.2300	0.3800	0.4700	0.4400	0.6481	0.6875	0.0953
CO2	93.8000	93.6000	93.9000	93.0000	87.3386	91.4907	12.4584

	1994		1996	1997	2006*		
	Smiley Mt. Baker	N. Wall Mt. Baker	Smiley Mt. Baker	Smiley Mt. Baker	MB-1 Mt. Baker	MB-2 Mt. Baker	MB-3 Mt. Baker
C2H6	na	na	na	na	0.0001	0.0002	<0.0002
H2S	na	na	5.1000	5.2000	2.9892	3.4526	<0.0005
CO	na	na	na	na	<0.001	<0.001	<0.001
C3H8	na	na	na	na	<0.0005	<0.0005	<0.0005
C4H10	na	na	na	na	<0.0005	<0.0005	<0.0005

\*2006 samples collected by D. Tucker, Mount Baker Volcano Research Center

References:

1994 data:

Symonds, R. B., Janik, C. J., Evans, W. C., Ritchie, B. E., Counce, D., Poreda, R. J., and Iven, M., 2003, Scrubbing masks magmatic degassing during repose at Cascade Range and Aleutian arc volcanoes: *U.S. Geological Survey Open-File Report 03-435*, 22 p.

Symonds, R. B., Poreda, R. J., Evans, W. C., Janik, C. J., and Ritchie, B. E., 2003, Mantle and crustal sources of carbon, nitrogen, and noble gases in Cascade Range and Aleutian arc volcanic gases: *U.S. Geological Survey Open-File Report 03-436*, 25 p.

2006 data

Werner, C., Evans, W.C., Poland, M., Tucker, D.S., and Doukas, M., 2009, Long-term changes in quiescent degassing at Mount Baker volcano, Washington, USA; evidence for a stalled intrusion in 1975 and a connection to a deep magma source: *Journal of Volcanology and Geothermal Research*, v. 186, p. 379-386.

Sample locations: 'Smiley' is a prominent fumarole group inside the west rim of Sherman Crater just above the snowy floor. 'North Wall' is at the top of the prominent talus slope on the northwest side of the crater. MB-1, MB-2 and MB-3 are inside the west rim, and include the Smiley group.