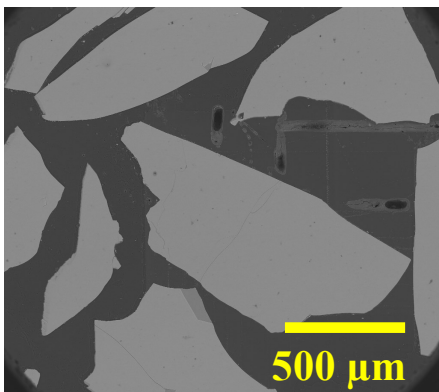




Smithsonian
National Museum of Natural History

Glass, Basalt NMNH 113498-1 (A-99)

SiO ₂ :	50.94	Na ₂ O:	2.66
Al ₂ O ₃ :	12.49	K ₂ O:	0.82
Fe ₂ O ₃ :	1.87	TiO ₂ :	4.06
FeO:	11.62	P ₂ O ₅ :	0.38
MgO:	5.08	MnO:	0.15
CaO:	9.30	H ₂ O:	0.02
TOTAL		99.39	



Analyst: J. Norberg (Jarosewich et. al., 1980).
Source: Makaopuhi Lava Lake, Hawaii

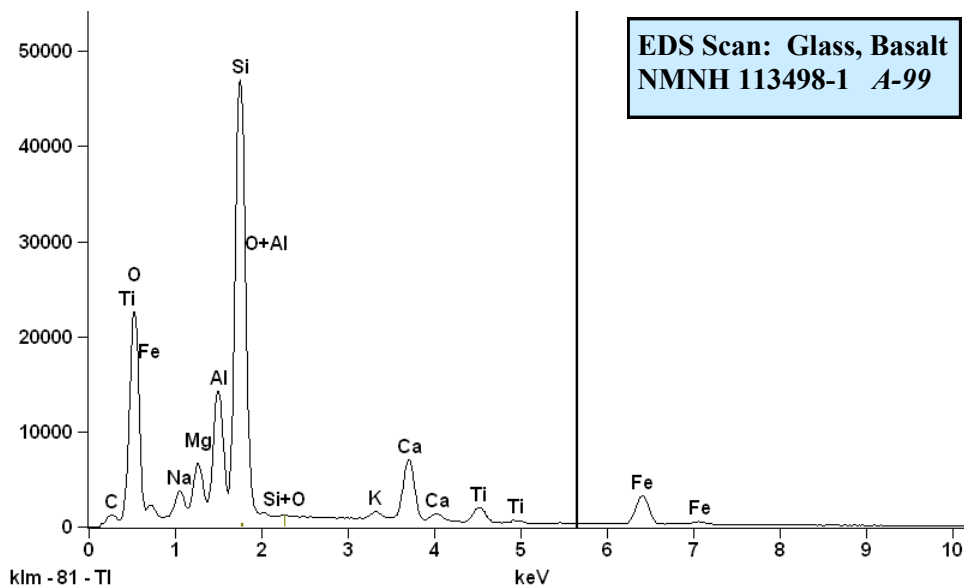
Size fractions available:
2.0 mm - 0.841 mm
1.0 mm - 0.5 mm
0.840 mm - 0.42 mm

Standard Specifics:

Impurities: plagioclase crystals, tiny; common

clinopyroxene crystals, tiny; rare

Sulfur in A-99: see next page



References:

Jarosewich, E., Nelen, J. A., and Norberg, J. A. (1980) Reference Samples for Electron Microprobe Analysis. *Geostandards Newsletter* 4, p. 43-47.

Jarosewich, E., et. al. (1979) Microprobe Analyses of Four Natural Glasses and One Mineral: An Interlaboratory Study of Precision and Accuracy. *Smith Contr. Ear. Sci.* 22, p. 53-67.

Sulfur in glass A-99 in wt. %

Reference	A-99
Dixon et al. (1991)	0.0170
Thordarson (1996)	0.0135
Thordarson (1996)	0.0220
De Hoog (2001)	0.0177
Thornber et al. (2002)	0.0096
Witter et al. (2005)	0.0138
Bell et al. (2009)	0.0155
Jego and Dasgupta (2014)	.016
Marion LeVoyer (pers, comm, 2014) n = >300, 2SD, ionprobe	0.0143 ± .0010

Selected references:

J.E. Dixon, D.A. Clague, E.M. Stolper (1991) Degassing history of water, sulfur and carbon in submarine lavas from Kilauea volcano, Hawaii, *J. Geol.*, **99** (1991), pp. 371–394.

Jego and Dasgupta (2014) The Fate of Sulfur During Fluid-Present Melting of Subducting Basaltic Crust at Variable Oxygen Fugacity. *Journal of Petrology*, Vol. 55, No. 6, 1019-1050.

Thornber, C.R., Sherrod, D.R., Siems, D.F., Heliker, C.C., Meeker, G.P., Oscarson, R.L., and Kauahikaua, J.P., 2002, Whole-rock and glass major-element geochemistry of Kilauea Volcano, Hawaii, near-vent eruptive products; September 1994 through September 2001: U.S. Geological Survey, v. OF 02-0017.