

Table 1. Morphometric data for selected flow lobes from Hawaii, observed during KAIKO dives K89, K94, and K96. Volumes were calculated assuming a hemiellipsoid with axial length l , width w , and height h , for which volume is given by $\pi lwh/6$.

Dive#	Lobe I.D.	Observation time	Depth [m]	Morphology	Observed lobe dimensions					Supplied volume	Increased volume %	Emplace-ment time te [min]	Time for crust to solidify tc [min]	Lava-supply rate [m ³ /min]
					l [m]	w [m]	h [m]	V [m ³]	Upper crust [m]					
K89	Pa-1	13:52	2573	inflated	10.0	10.0	2.0	105	0.20	89	549	130	845	0.12
K89	Pa-2	14:18	2561	hollow	6	4.5	0.7	9.9	0.15	6.6	203	43	131	0.08
K94	Pa-1	12:42	3897	hollow	20.0	20.0	5.0	1047	0.15	999	2065	6.0	131	8.0
K94	Pa-2	12:53	3899	hollow	4.4	0.8	0.4	0.7	0.04	0.6	549	1.4	9	0.08
K96	Pa-1	13:57	4867	inflated	6.0	4.0	2.0	25	0.10	23	1199	16.3	212	0.12
K96	Pa-2	13:58	4867	inflated	3.4	2.6	1.0	4.6	0.10	3.9	549	32.7	212	0.02
K96	Pa-3-2	13:54	4866	inflated	2.1	0.5	0.7	0.4	0.05	0.4	770	6	53	0.01
K96	Pa-4	13:58	4667	inflated	3.1	2.8	1.0	4.5	0.08	3.9	695	17	136	0.03
K96	Pa-5	13:58	4666	inflated	3.5	1.8	0.8	2.8	0.07	2.5	679	13	104	0.03

Appendix 1. Symbols and values used in the computation of cooling time of subaqueous lava after Griffiths and Fink (1992a, 1992b). The temperatures at the base of crust and glass transition are assumed to be 1323 K (1050 °C) and 1003 K (730 °C), respectively for tholeiitic basalt lobes observed on KAIKO dives at Loihi south rift (Barth et al., 1994; Montierth et al., 1995; T. Shibata, 1999 personal comm.).

γ	constant	0.1	-
g	acceleration of gravity	9.8	$\text{m}^2 \cdot \text{s}^{-1}$
σ	Stefan-Boltzmann constant	5.67×10^{-8}	$\text{kg} \cdot \text{s}^{-3} \cdot \text{K}^{-4}$
ϵ	emissivity	0.9	-

Physical properties and symbols of basalt lava

ρ_m	density	2600	$\text{kg} \cdot \text{m}^{-3}$
c_m	specific heat	1200	$\text{m}^2 \cdot \text{s}^{-2} \cdot \text{K}^{-1}$
κ_m	thermal diffusivity	5×10^{-7}	$\text{m}^2 \cdot \text{s}^{-1}$
λ_m	Thermal conductivity	1.56	$\text{m} \cdot \text{kg} \cdot \text{s}^{-3} \cdot \text{K}^{-1}$
T_{initial}	Initial temperature	1423	K
T_g	Glass transition temperature	1003	K
T_c	Temperature at the surface	-	K

Physical properties of water at 1000-4000 m deep

ρ_a	density	1000	$\text{kg} \cdot \text{m}^{-3}$
c_a	specific heat	4000	$\text{m}^2 \cdot \text{s}^{-2} \cdot \text{K}^{-1}$
κ_a	thermal diffusivity	1.0×10^{-7}	$\text{m}^2 \cdot \text{s}^{-1}$
ν_a	kinematic viscosity	1.0×10^{-6}	$\text{m}^2 \cdot \text{s}^{-1}$
α_a	expansion coefficient	1.0×10^{-2}	K^{-1}