



John Apel

01/16/2007 07:42 AM
MST

To: Doug Owen/CRMO/NPS@NPS
CC:
Subject: Fw: Tachylyte XRF results

FYI

John K. Apel, Resource Program Manager

National Park Service

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Craig Skinner
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01/15/2007 11:08 AM
PST

To: "Suzann Henrikson" <lhenrikson@csu.edu>, John_Apel@nps.gov
cc: cskinner@obsidianlab.com
Subject: Tachylyte XRF results

Hi all,

Those two tachylyte samples arrived on Saturday and I finished up the analysis first thing on Monday morning. See the attachment for a summary table of the XRF results.

First off, I'm pretty certain that the material IS a true tachylyte, a basaltic glass. Visually the material looks right and geochemically it also looks good - Fe and Ti are always elevated for these (relative to rhyolitic glasses) and some of the other trace elements that I look at are often a little odd and distinctive. For these samples, the Zr content is quite high and gives the stuff a very distinctive trace element signature. The two samples from the Headquarters toilet hole are also very similar in composition and are from the same parent source (no surprise). Hard to tell whether or not the tachylyte from this source was used as a

prehistoric lithic resource, though - a search in the lab database of Idaho artifacts from unknown sources didn't reveal any matches. If it was used, it would most likely show up at sites in the immediate vicinity. It may be that this information is mostly of academic significance although that's good enough for me.

Craig

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Craters of the Moon Tachylite XRF Results.pdf

Appendix

Results of X-Ray Fluorescence Analysis

Northwest Research Obsidian Studies Laboratory

Table A-1. Results of XRF Studies: Headquarters Tachylyte, Craters of the Moon National Monument, Butte County, Idaho

Site	Specimen No.	Catalog No.	Trace Element Concentrations										Ratios		Geochemical Source	
			Zn	Pb	Rb	Sr	Y	Zr	Nb	Ti	Mn	Ba	Fe ₂ O ₃ ^T	Fe:Mn		Fe:Ti
Craters of the Moon	1	1511-1	271 ± 16	38 8	104 5	229 10	134 4	2072 13	151 3	4648 101	1354 30	2777 35	8.44 0.11	50.3	59.9	Headquarters Tachylyte
			273 ± 17	33 8	92 5	210 10	137 4	2034 13	149 3	4249 100	1024 29	2843 35	7.57 0.11	59.8	58.8	
RGM-1	RGM-1	RGM-1	42 ± 11	22 5	167 5	111 9	25 3	225 10	6 2	1754 92	507 28	765 32	1.78 0.11	29.4	34.1	RGM-1 Reference Standard

All trace element values reported in parts per million; ± = analytical uncertainty estimate (in ppm). Iron content reported as weight percent oxide.
 NA = Not available; ND = Not detected; NM = Not measured.; * = Small sample.

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Craters of the Moon	1	1511-1	271	38	104	229	134	2072	151	4648	1354	2777	8.44	50.3	59.9	Headquarters Tachlylte
			± 16	8	5	10	4	13	3	101	30	35	0.11			
Craters of the Moon	2	1511-2	273	33	92	210	137	2034	149	4249	1024	2843	7.57	59.8	58.8	Headquarters Tachlylte
			± 17	8	5	10	4	13	3	100	29	35	0.11			
RGM-1	RGM-1	RGM-1	42	22	167	111	25	225	6	1754	507	765	1.78	29.4	34.1	RGM-1 Reference Standard
			± 11	5	5	9	3	10	2	92	28	32	0.11			

All trace element values reported in parts per million: ± = analytical uncertainty estimate (in ppm). Iron content reported as weight percent oxide.
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