

Table S1: Electron microprobe compositions for olivine samples meeting spectral quality criteria; labels indicate sample number and nominal composition.

	C1DD98 / Fo ₀	C1DD97 / Fo ₁₀	C1DD ₉₆ / Fo ₂₀	C1DD95 / Fo ₃₀	C1DD42 / Fo ₄₀	C1DD39 / Fo ₇₀
# analyses (n)	7	8	15	13	4	14
SiO ₂	29.26	30.55	31.86	32.43	34.49	37.05
TiO ₂	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Al ₂ O ₃	0.03	0.03	n.d.	n.d.	n.d.	0.01
Cr ₂ O ₃	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MgO	n.d.	4.25	9.02	13.22	18.97	32.73
FeO	69.88	64.77	58.89	53.93	47.62	30.83
CaO	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
MnO	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
NiO	n.d.	0.01	0.01	n.d.	n.d.	0.01
Na ₂ O	n.d.	n.d.	n.d.	0.01	0.01	0.01
Total	99.20	99.64	99.81	99.62	101.12	100.67
Mg'	0.01	10.47	21.44	30.40	41.52	65.42
$\sigma_{\text{Mg\#}}$ *	0.02	0.19	1.76	0.29	0.25	1.42

*Standard deviation of Mg#