Table S1. Redox sensitive trace elements arsenic, vanadium and molybdenum (ppm). Every sample was measured 6 times (2 spots, 3 measurements each) by LA-ICP-MS. The mean values were calculated. (This data is shown in Fig. 4).

Sample No.	As mean (ppm)	V mean (ppm)	Mo mean (ppm)
KAN 8.25	0.730	7.973	3.485
KAN 11.0	1.502	7.812	4.353
KAN 11.9	2.200	19.491	1.789
KAN 12.8	2.300	NA	7.162
KAN 13.2	3.246	17.604	4.497
KAN 14.2	0.500	7.856	0.511
KAN 15.4	0.404	7.327	0.707
KAN 16.3	0.620	10.911	0.813
KAN 16.6	1.354	16.061	2.300
KAN 16.85	1.114	9.237	0.940
KAN 18.7	0.846	8.694	0.890
KAN 19.0	1.908	7.325	1.401
KAN 19.3	0.739	6.537	0.922
KAN 20.0	0.772	7.412	0.943
KAN 20.3	0.487	8.640	0.554
KAN 20.8	0.494	8.381	0.568
KAN 21.2	0.347	3.269	0.739
KAN 21.85	0.537	5.980	0.709
KAN 22.4	0.500	5.651	0.527
KAN 22.7	0.661	14.543	2.656
KAN 23.3	0.799	15.898	3.663
KAN 23.6	0.492	12.632	2.429
KAN 23.9	0.886	11.636	3.761
KAN 24.2	1.580	NA	NA
KAN 24.8	NA	11.120	0.806
KAN 25.2	0.773	6.725	1.601
KAN 25.5	1.176	4.734	NA
KAN 26.4	0.841	11.357	1.085
KAN 26.6	1.352	11.378	2.474
KAN 27.0	0.146	NA	NA
KAN 27.6	0.300	2.943	0.183

KAN 27.9	0.173	3.248	0.195
KAN 29.4	0.074	NA	0.130
KAN 30.8	0.361	11.558	1.039

Table S2. Rare Earth Elements cerium, lanthanum and praseodymium (ppm) and Ce anomalies. REEs and redox sensitive trace elements were measured using LA-ICP-MS. Ce anomalies were defined following Nozaki`s calculation (2008): $Ce/Ce^* = 2Ce_N / (La_N + Pr_N)$. (This data is shown in Fig. 5).

Sample	Ce mean (ppm)	La mean (ppm)	Pr mean (ppm)	Ce/Ce*
KAN 12,8	0.015	0.031	0.016	0.642
KAN 13,2	0.013	0.040	0.019	0.423
KAN 14,2	0.004	0.014	0.005	0.408
KAN 15,4	0.005	0.017	0.007	0.400
KAN 16,3	0.010	0.033	0.016	0.422
KAN 16,6	0.012	0.032	0.016	0.522
KAN 16,85	0.011	0.029	0.019	0.445
KAN 20,8	0.012	0.023	0.016	0.588
KAN 21,2	0.011	0.017	0.012	0.776
KAN 21,85	0.008	0.016	0.010	0.626
KAN 22,4	0.013	0.020	0.014	0.786
KAN 22,7	0.016	0.020	0.017	0.876
KAN 24,65	0.013	0.015	0.013	0.946
KAN 24,8	0.020	0.023	0.020	0.929
KAN 25,2	0.017	0.018	0.017	0.953
KAN 25,5	0.014	0.018	0.015	0.868
KAN 26,4	0.016	0.029	0.019	0.678
KAN 26,6	0.014	0.025	0.014	0.724
KAN 27,0	0.012	0.030	0.013	0.584
KAN 27,6	0.015	0.048	0.015	0.471

Table S3. Uranium isotope ratios and twice the standard deviation. Uranium isotope analysis were performed using MC-ICP-MS. Results are provided in the delta-notation: $\delta^{238}U$ in ‰ = [$(^{238}U / ^{235}U)_{sample}$ / $(^{238}U / ^{235}U)_{standard}$ -1] x 1000. (This data is shown in Fig. 5).

Sample	mean $^{238}U/^{235}U$	2 S.D.
KAN12.8	0.260	0.06
KAN13.2	0.439	0.04
KAN16.3	0.363	0.02
KAN16.6	0.415	0.04
KAN16.75	0.264	0.03
KAN19	0.180	0.01
KAN20.0	0.111	0.04
KAN20.9	0.092	0.02
KAN21.2	0.142	0.04
KAN22.4	0.074	0.05
KAN23.3	0.103	0.16
KAN23.9	0.154	0.09
KAN24.8	0.060	0.02
KAN25.5	-0.021	0.05
KAN27.6	0.202	0.05

Table S4. The Lanthanum anomaly, to test whether the Ce anomaly values are genuine or an artifact caused by elevated amounts of lanthanum. The calculation of Pr/Pr* is given by $2Pr_N$ / (Ce_N + Nd_N). Calculation of Ce/Ce* is explained in Table 2. (This data is shown in Fig. 6).

Sample	La (ppm)	Ce (ppm)	Pr (ppm)	Nd (ppm)	Pr* (ppm)	Pr/Pr*	Ce* (ppm)	Ce/Ce*
KAN 7,2	0.010	0.010	0.010	0.011	0.021	0.961	0.020	1.016
KAN 7,6	0.012	0.013	0.013	0.014	0.027	0.983	0.026	0.997
KAN 8,25	0.013	0.011	0.012	0.012	0.023	1.008	0.025	0.922
KAN 11,0	0.008	0.003	0.003	0.003	0.006	1.005	0.011	0.526
KAN 11,9	0.008	0.003	0.003	0.003	0.007	0.955	0.011	0.573

KAN 12,8	0.031	0.015	0.016	0.016	0.031	1.051	0.047	0.642
KAN 13,2	0.040	0.013	0.019	0.021	0.034	1.156	0.059	0.423
KAN 14,2	0.014	0.004	0.005	0.005	0.009	1.046	0.019	0.408
KAN 15,4	0.017	0.005	0.007	0.007	0.012	1.101	0.024	0.400
KAN 16,3	0.033	0.010	0.016	0.017	0.028	1.141	0.049	0.422
KAN 16,6	0.032	0.012	0.016	0.017	0.029	1.077	0.048	0.522
KAN 16,75	0.025	0.010	0.012	0.014	0.023	1.056	0.037	0.515
KAN 16,85	0.029	0.011	0.019	0.020	0.031	1.204	0.048	0.445
KAN 18,7	0.030	0.009	0.017	0.019	0.028	1.168	0.046	0.401
KAN 19,0	0.044	0.010	0.045	0.049	0.059	1.542	0.089	0.218
KAN 19,3	0.030	0.011	0.028	0.031	0.042	1.316	0.058	0.364
KAN 20,0	0.037	0.015	0.035	0.039	0.054	1.291	0.072	0.423
KAN 20,3	0.029	0.013	0.025	0.028	0.042	1.199	0.054	0.495
KAN 20,8	0.023	0.012	0.016	0.018	0.030	1.104	0.039	0.588
KAN 21,2	0.017	0.011	0.012	0.013	0.024	0.967	0.029	0.776
KAN 21,85	0.016	0.008	0.010	0.011	0.026	1.148	0.026	0.626
KAN 22,4	0.020	0.013	0.014	0.015	0.029	0.974	0.034	0.786
KAN 22,7	0.020	0.016	0.017	0.017	0.034	0.997	0.037	0.876
KAN 23,3	0.092	0.017	0.099	0.105	0.089	1.595	0.190	0.178
KAN 23,6	0.085	0.015	0.075	0.088	0.103	1.456	0.160	0.185
KAN 23,9	0.080	0.014	0.082	0.092	0.106	1.555	0.162	0.173
KAN 24,2	0.054	0.017	0.036	0.042	0.044	1.169	0.090	0.373
KAN 24,65	0.015	0.013	0.013	0.014	0.026	0.961	0.027	0.946
KAN 24,8	0.023	0.020	0.020	0.020	0.024	0.960	0.043	0.929
KAN 25,2	0.018	0.017	0.017	0.018	0.029	1.006	0.035	0.953
KAN 25,5	0.018	0.014	0.015	0.015	0.026	1.035	0.033	0.868
KAN 26,4	0.029	0.016	0.019	0.021	0.037	1.039	0.048	0.678
KAN 26,6	0.025	0.014	0.014	0.015	0.029	0.971	0.039	0.724
KAN 27,0	0.030	0.012	0.013	0.014	0.027	0.978	0.043	0.584
KAN 27,6	0.048	0.015	0.015	0.017	0.032	0.963	0.063	0.471
KAN 27,9	0.065	0.019	0.019	0.022	0.041	0.942	0.084	0.460
KAN 29,4	0.043	0.026	0.027	0.031	0.056	0.960	0.070	0.729
KAN 30,0	0.043	0.027	0.028	0.031	0.058	0.957	0.070	0.758
KAN 30,8	0.080	0.053	0.053	0.059	0.113	0.939	0.133	0.805
KAN 33,4	0.107	0.115	0.118	0.126	0.241	0.981	0.225	1.019
KAN 34,0	0.089	0.082	0.096	0.103	0.186	1.037	0.185	0.886