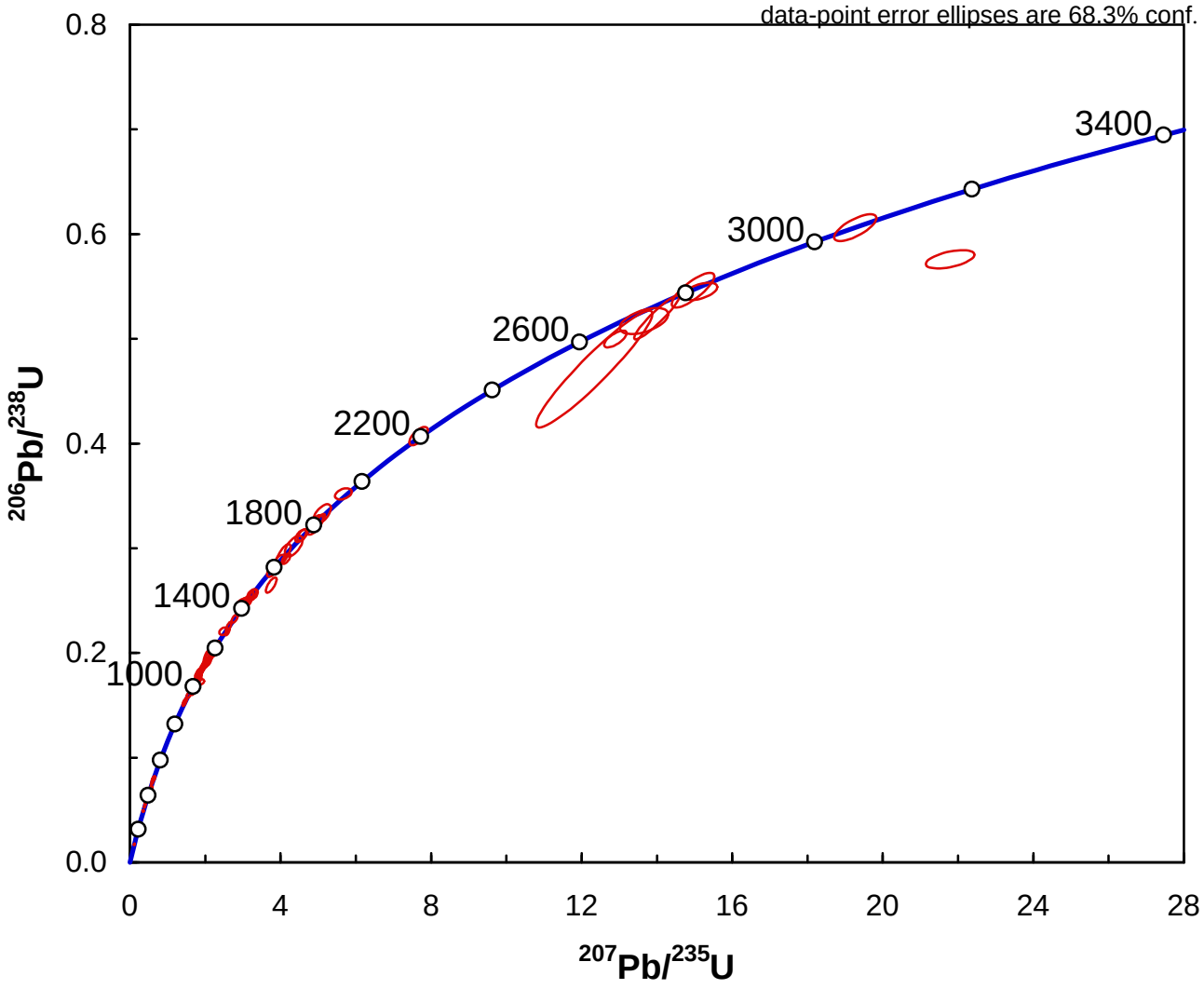
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0.8
0.6
0.4
0.2
0.0
0
4
8
12
16
20
24
28
1000
1400
1800
2200
2600
3000
3400
206Pb/238U
207Pb/235U

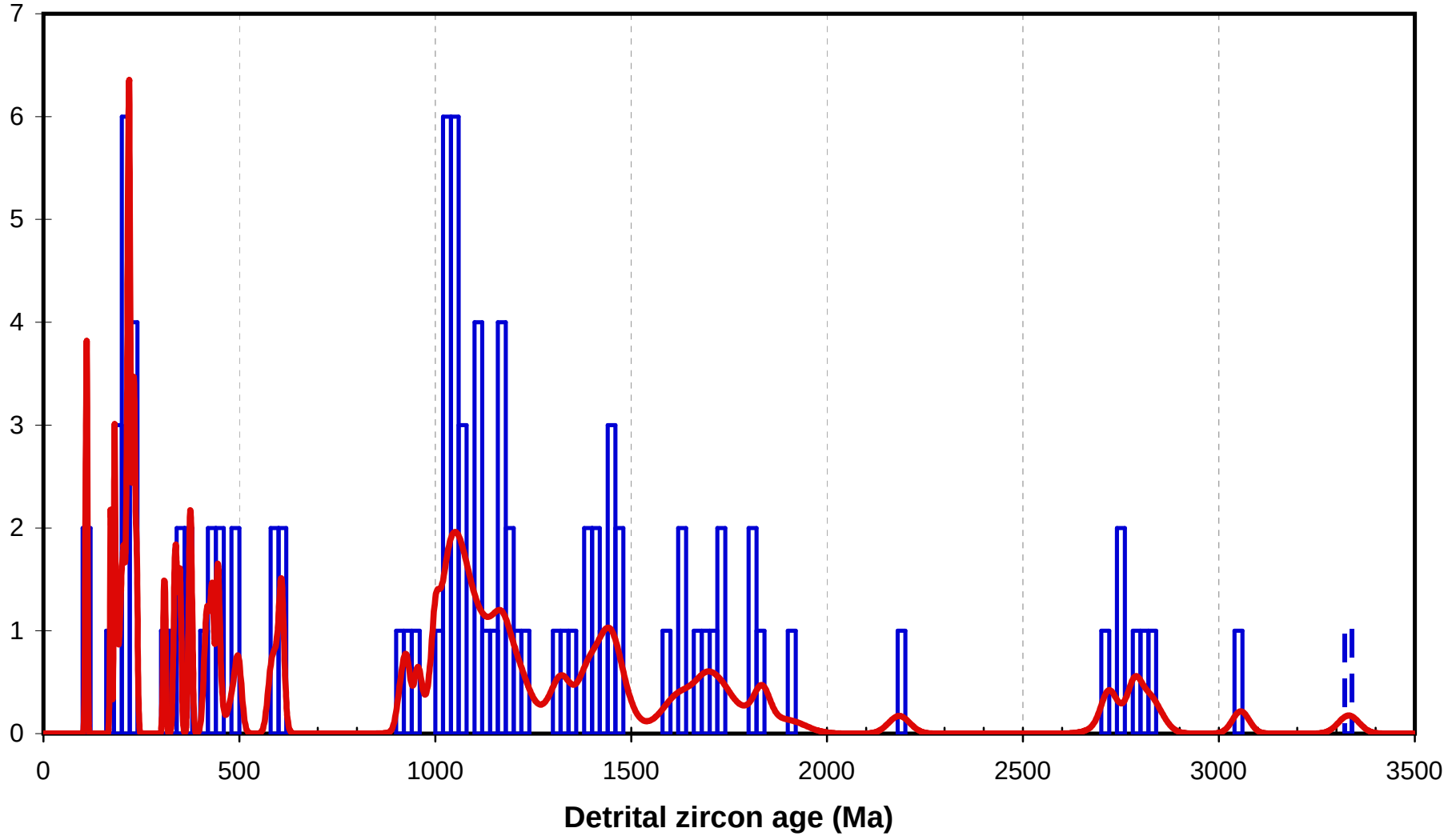
7
6
5
4
3
2
1
0
0
500
1000
1500
2000
2500
3000
3500
Detrital zircon age (Ma)

Table DR1. U-Pb (zircon) geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

					Isotopic ratios						Apparent ages (Ma)					
Analysis	U	206Pb	U/Th	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±
	(ppm)	204Pb		235U	(%)	238U	(%)	corr.	238U	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)
Sample KBCR, Cintura Formation of Bisbee Group, Rucker Canyon, Chiricahua Mountains, Arizona																
KBCR-73	1077	13366	1.6	0.11106	3.8	0.01695	1.9	0.50	108.3	2.1	106.9	3.9	76.2	78.6	108.3	2.1
KBCR-45	467	5160	1.2	0.11499	2.9	0.01741	1.5	0.51	111.3	1.6	110.5	3.0	94.8	58.9	111.3	1.6
KBCR-100	246	4602	1.7	0.18146	3.9	0.02706	1.2	0.31	172.1	2.1	169.3	6.1	130.6	87.5	172.1	2.1
KBCR-58	484	11331	3.7	0.19547	2.8	0.02856	1.0	0.36	181.5	1.8	181.3	4.6	178.2	60.6	181.5	1.8
KBCR-67	163	2620	0.9	0.20133	5.8	0.02953	2.7	0.46	187.6	4.9	186.2	9.9	169.1	120.9	187.6	4.9
KBCR-28	243	4801	0.6	0.21488	3.4	0.03132	1.9	0.55	198.8	3.7	197.6	6.2	183.5	66.6	198.8	3.7
KBCR-92	140	2208	1.3	0.21348	5.5	0.03239	1.6	0.30	205.5	3.3	196.5	9.9	89.3	124.9	205.5	3.3
KBCR-79	175	5325	0.6	0.22926	4.0	0.03391	1.7	0.42	214.9	3.6	209.6	7.6	149.8	85.8	214.9	3.6
KBCR-37	218	5600	1.3	0.23406	3.6	0.03421	2.6	0.71	216.8	5.5	213.5	7.0	177.4	59.2	216.8	5.5
KBCR-95	195	3224	1.3	0.23374	4.1	0.03421	1.4	0.34	216.9	3.0	213.3	7.8	173.8	89.6	216.9	3.0
KBCR-42	216	9210	1.6	0.23656	3.2	0.03445	2.4	0.74	218.4	5.1	215.6	6.2	185.6	50.3	218.4	5.1
KBCR-82	567	12457	0.8	0.24081	1.5	0.03459	1.0	0.65	219.2	2.2	219.1	3.0	217.5	26.8	219.2	2.2
KBCR-21	131	3021	0.7	0.24619	3.6	0.03561	2.1	0.57	225.6	4.5	223.5	7.2	201.5	68.8	225.6	4.5
KBCR-50	139	4534	0.9	0.24767	3.7	0.03610	2.4	0.66	228.6	5.4	224.7	7.4	183.5	64.2	228.6	5.4
KBCR-62	249	7219	1.6	0.24945	3.9	0.03657	1.0	0.26	231.6	2.3	226.1	7.8	170.0	86.9	231.6	2.3
KBCR-41	411	9045	5.3	0.26439	4.5	0.03754	1.2	0.28	237.5	2.9	238.2	9.5	244.7	99.2	237.5	2.9
KBCR-53	172	6413	0.8	0.34870	3.3	0.04907	1.0	0.30	308.8	3.0	303.7	8.7	264.8	72.4	308.8	3.0
KBCR-70A	221	7974	1.7	0.38653	2.1	0.05342	1.2	0.57	335.5	3.9	331.8	6.0	306.4	39.6	335.5	3.9
KBCR-84	411	15534	1.9	0.39588	1.9	0.05427	1.4	0.74	340.7	4.6	338.7	5.4	324.7	28.4	340.7	4.6
KBCR-39	333	14757	1.6	0.40375	2.5	0.05562	1.0	0.40	349.0	3.4	344.4	7.2	313.5	51.5	349.0	3.4
KBCR-35	320	9758	3.1	0.44085	3.1	0.05958	1.0	0.32	373.1	3.6	370.8	9.7	357.0	67.1	373.1	3.6
KBCR-31	154	3575	0.5	0.43878	3.2	0.06024	1.0	0.31	377.1	3.7	369.4	10.0	321.2	69.9	377.1	3.7
KBCR-14	196	5888	1.6	0.50952	3.2	0.06652	1.8	0.57	415.1	7.3	418.1	11.0	434.6	58.7	415.1	7.3
KBCR-86	93	2752	1.5	0.50304	3.6	0.06744	1.6	0.45	420.7	6.7	413.8	12.3	375.1	72.4	420.7	6.7
KBCR-43	299	19223	1.1	0.52659	2.4	0.06915	1.0	0.42	431.0	4.2	429.5	8.4	421.5	48.5	431.0	4.2
KBCR-76	352	24768	1.1	0.57804	2.3	0.07143	1.0	0.43	444.7	4.3	463.2	8.6	555.8	45.6	444.7	4.3
KBCR-51	133	8632	1.1	0.55440	2.2	0.07195	1.8	0.80	447.9	7.6	447.9	8.0	447.9	29.5	447.9	7.6
KBCR-74	113	3996	1.2	0.60139	4.0	0.07791	2.9	0.73	483.6	13.6	478.1	15.3	451.7	60.9	483.6	13.6
KBCR-72	207	9715	1.7	0.63415	4.0	0.08026	1.8	0.45	497.7	8.5	498.7	15.7	503.2	78.3	497.7	8.5
KBCR-8	212	8353	2.1	0.77245	2.4	0.09429	1.7	0.71	580.9	9.5	581.2	10.7	582.3	37.0	580.9	9.5
KBCR-65	97	6898	1.7	0.78582	3.1	0.09673	2.0	0.63	595.2	11.1	588.8	13.9	564.2	52.5	595.2	11.1
KBCR-7	161	11843	0.7	0.82149	3.9	0.09853	1.7	0.43	605.8	9.7	608.9	17.9	620.4	76.0	605.8	9.7
KBCR-63	230	26234	0.9	0.82949	2.3	0.09892	1.0	0.43	608.1	5.8	613.3	10.7	632.7	44.9	608.1	5.8
KBCR-66	105	10025	1.9	1.44261	2.1	0.15232	1.3	0.60	913.9	11.0	906.8	12.9	889.4	35.3	913.9	11.0

KBCR-81	138	14082	1.0	1.47982	1.8	0.15489	1.1	0.60	928.3	9.3	922.2	10.8	907.4	29.2	928.3	9.3
KBCR-10	91	9832	2.8	1.55970	2.3	0.15972	1.1	0.47	955.2	9.5	954.4	14.1	952.3	41.2	955.2	9.5
KBCR-49	380	42705	1.8	1.66953	1.5	0.16782	1.0	0.69	1000.1	9.3	997.0	9.2	990.2	21.4	1000.1	9.3
KBCR-64	149	17183	0.9	1.73694	1.6	0.17140	1.1	0.69	1019.8	10.3	1022.3	10.2	1027.6	23.1	1027.6	23.1
KBCR-15	61	6724	0.4	1.81875	3.0	0.17943	1.0	0.33	1063.9	9.8	1052.2	19.6	1028.1	57.0	1028.1	57.0
KBCR-16	35	4095	0.7	1.82347	3.3	0.17983	2.0	0.62	1066.1	19.9	1053.9	21.4	1028.9	51.8	1028.9	51.8
KBCR-54	158	25137	1.4	1.72368	1.6	0.16993	1.2	0.72	1011.7	10.8	1017.4	10.4	1029.6	22.7	1029.6	22.7
KBCR-99	226	18790	1.8	1.75331	2.3	0.17241	1.2	0.51	1025.4	11.3	1028.4	15.0	1034.8	40.3	1034.8	40.3
KBCR-71	47	4967	1.2	1.85052	2.7	0.18176	1.2	0.44	1076.6	11.9	1063.6	18.0	1037.1	49.6	1037.1	49.6
KBCR-69	373	36104	2.1	1.79002	1.8	0.17525	1.0	0.55	1041.0	9.6	1041.8	11.8	1043.6	30.5	1043.6	30.5
KBCR-3	47	7313	1.4	1.84197	2.1	0.17926	1.5	0.73	1062.9	14.6	1060.6	13.6	1055.7	28.6	1055.7	28.6
KBCR-12	190	28267	1.4	1.86892	2.2	0.18178	1.7	0.79	1076.7	17.1	1070.1	14.5	1056.8	27.1	1056.8	27.1
KBCR-77	24	4952	0.6	1.79020	4.3	0.17409	3.0	0.69	1034.6	28.4	1041.9	28.2	1057.2	63.2	1057.2	63.2
KBCR-40	120	17966	2.0	1.83986	2.1	0.17881	1.3	0.64	1060.5	13.1	1059.8	13.9	1058.4	32.7	1058.4	32.7
KBCR-27	85	9920	0.8	1.88260	2.6	0.18290	1.6	0.60	1082.8	15.5	1075.0	17.1	1059.1	41.6	1059.1	41.6
KBCR-20	76	9541	1.4	1.85486	2.0	0.17995	1.2	0.62	1066.7	12.2	1065.2	13.3	1061.9	31.7	1061.9	31.7
KBCR-93	124	14042	2.7	1.72039	3.5	0.16688	2.8	0.80	994.9	25.6	1016.2	22.4	1062.2	42.3	1062.2	42.3
KBCR-24	105	9538	0.8	1.93749	2.7	0.18632	1.8	0.67	1101.4	18.6	1094.1	18.4	1079.7	40.8	1079.7	40.8
KBCR-87	242	22761	2.1	1.98933	2.6	0.18863	1.2	0.46	1113.9	12.2	1111.9	17.3	1107.9	45.3	1107.9	45.3
KBCR-68	79	10402	1.0	2.00557	2.6	0.19008	1.3	0.50	1121.8	13.5	1117.4	17.7	1108.8	45.2	1108.8	45.2
KBCR-47	29	3126	1.2	2.07261	3.3	0.19570	2.6	0.78	1152.2	27.2	1139.8	22.7	1116.3	41.5	1116.3	41.5
KBCR-5	33	5878	0.5	2.02027	2.9	0.19058	1.7	0.58	1124.5	17.4	1122.3	19.7	1118.1	47.1	1118.1	47.1
KBCR-6	41	4877	1.0	2.09422	4.3	0.19685	2.7	0.61	1158.4	28.1	1146.9	29.8	1125.3	68.4	1125.3	68.4
KBCR-26	78	16673	0.7	2.07614	2.3	0.19357	1.0	0.46	1140.7	11.0	1141.0	15.6	1141.5	40.2	1141.5	40.2
KBCR-11	380	39235	1.1	2.06833	2.2	0.19089	1.0	0.45	1126.2	10.3	1138.4	15.1	1161.6	39.1	1161.6	39.1
KBCR-33	449	45107	1.5	2.17501	1.4	0.19987	1.0	0.71	1174.6	10.7	1173.1	9.9	1170.3	19.8	1170.3	19.8
KBCR-38	81	15152	1.6	2.19609	2.2	0.20146	1.2	0.53	1183.2	12.8	1179.8	15.5	1173.6	37.2	1173.6	37.2
KBCR-9	464	26023	3.4	1.87863	3.1	0.17233	1.0	0.32	1024.9	9.5	1073.6	20.8	1173.7	58.8	1173.7	58.8
KBCR-90	143	27258	2.6	2.20540	2.5	0.20077	1.5	0.60	1179.5	16.2	1182.8	17.6	1188.7	39.7	1188.7	39.7
KBCR-80	171	19690	1.1	2.19888	3.0	0.19936	1.0	0.33	1171.9	10.7	1180.7	21.0	1196.8	56.0	1196.8	56.0
KBCR-94	228	29770	1.6	2.31802	1.7	0.20825	1.0	0.57	1219.5	11.1	1217.8	12.4	1214.9	28.2	1214.9	28.2
KBCR-97	67	8470	1.0	2.48553	3.0	0.22073	1.1	0.35	1285.7	12.4	1267.8	21.9	1237.6	55.7	1237.6	55.7
KBCR-18	114	20208	1.3	2.62043	1.8	0.22503	1.3	0.73	1308.4	16.0	1306.4	13.6	1303.0	24.6	1303.0	24.6
KBCR-2	218	36152	0.9	2.59059	1.4	0.22017	1.0	0.69	1282.8	11.6	1298.0	10.6	1323.2	20.2	1323.2	20.2
KBCR-78	99	21293	1.4	2.77798	1.8	0.23263	1.0	0.54	1348.3	12.2	1349.6	13.7	1351.8	29.8	1351.8	29.8
KBCR-44	311	35146	1.6	2.96767	2.0	0.24371	1.7	0.84	1406.0	21.6	1399.4	15.5	1389.3	21.2	1389.3	21.2
KBCR-36	335	67655	2.2	3.04138	3.7	0.24850	1.0	0.27	1430.7	12.8	1418.1	28.6	1399.1	69.2	1399.1	69.2
KBCR-4	78	17857	1.0	3.01638	2.9	0.24631	1.8	0.60	1419.4	22.4	1411.8	22.3	1400.2	44.6	1400.2	44.6
KBCR-34	99	14875	0.6	3.00981	2.5	0.24358	1.8	0.71	1405.3	22.1	1410.1	18.9	1417.4	33.6	1417.4	33.6
KBCR-89	180	26077	1.9	3.11338	2.2	0.25003	1.1	0.51	1438.6	14.2	1436.0	16.6	1432.1	35.5	1432.1	35.5

KBCR-60	137	30827	1.7	3.01957	1.7	0.24143	1.0	0.59	1394.1	12.5	1412.6	12.9	1440.5	25.9	1440.5	25.9
KBCR-46	230	32379	1.8	3.06502	2.2	0.24480	1.4	0.63	1411.6	17.3	1424.0	16.7	1442.6	32.3	1442.6	32.3
KBCR-75	121	24550	1.0	3.17384	2.1	0.25271	1.6	0.76	1452.4	20.5	1450.8	16.0	1448.4	25.6	1448.4	25.6
KBCR-88	150	19576	2.2	3.26525	1.8	0.25654	1.0	0.56	1472.1	13.2	1472.8	14.0	1473.8	28.3	1473.8	28.3
KBCR-59	31	5914	1.5	3.25356	2.9	0.25556	1.4	0.48	1467.1	18.2	1470.0	22.5	1474.3	48.3	1474.3	48.3
KBCR-23	536	65064	0.9	3.78619	2.5	0.27936	1.6	0.63	1588.1	22.3	1589.8	20.2	1592.0	36.6	1592.0	36.6
KBCR-85	117	29614	2.4	3.99446	2.1	0.28940	1.0	0.48	1638.5	14.5	1633.1	16.8	1626.1	33.8	1626.1	33.8
KBCR-22	143	17280	0.4	4.06836	3.2	0.29339	2.4	0.75	1658.4	34.7	1648.0	26.0	1634.7	39.4	1634.7	39.4
KBCR-61	933	113932	6.9	3.75244	2.5	0.26480	1.8	0.73	1514.3	24.7	1582.6	20.0	1674.9	31.2	1674.9	31.2
KBCR-48	186	30800	1.5	4.15064	1.8	0.29007	1.1	0.64	1641.9	16.5	1664.3	14.6	1692.8	25.5	1692.8	25.5
KBCR-98	216	23293	1.1	4.35334	3.6	0.30214	2.2	0.61	1701.9	32.3	1703.5	29.4	1705.5	52.2	1705.5	52.2
KBCR-52	119	24038	0.9	4.53885	2.1	0.31187	1.2	0.59	1749.9	19.1	1738.1	17.5	1724.0	31.1	1724.0	31.1
KBCR-96	155	23744	0.7	4.58411	1.9	0.31280	1.1	0.59	1754.4	17.5	1746.4	16.2	1736.7	28.8	1736.7	28.8
KBCR-19	50	14097	3.0	4.90922	2.9	0.32228	1.9	0.65	1800.8	29.9	1803.8	24.8	1807.3	40.7	1807.3	40.7
KBCR-17	76	15125	0.9	5.09798	3.1	0.33239	1.9	0.62	1849.9	31.0	1835.8	26.2	1819.7	43.8	1819.7	43.8
KBCR-30	106	23568	1.2	5.06973	1.4	0.32782	1.0	0.70	1827.8	15.9	1831.1	12.2	1834.7	18.6	1834.7	18.6
KBCR-55	65	16815	0.5	5.66927	2.6	0.35192	1.0	0.39	1943.8	16.8	1926.7	22.2	1908.4	42.6	1908.4	42.6
KBCR-29	187	38081	1.2	7.66477	2.1	0.40707	1.4	0.67	2201.5	26.4	2192.5	18.9	2184.0	27.2	2184.0	27.2
KBCR-83	325	58384	5.6	12.89658	1.5	0.49979	1.1	0.69	2612.9	22.8	2672.1	14.4	2717.2	18.1	2717.2	18.1
KBCR-70	179	18392	0.9	12.33311	8.3	0.47110	7.8	0.95	2488.4	161.5	2630.1	77.9	2741.0	44.4	2741.0	44.4
KBCR-57	49	15562	0.5	13.65816	3.1	0.51698	1.6	0.51	2686.4	34.9	2726.3	29.5	2756.0	44.0	2756.0	44.0
KBCR-32	119	24215	1.3	13.99196	2.8	0.52043	2.7	0.94	2701.0	58.6	2749.2	26.9	2784.7	16.4	2784.7	16.4
KBCR-13	52	24053	0.7	14.95666	2.5	0.54649	2.0	0.80	2810.5	45.6	2812.5	23.7	2813.9	24.2	2813.9	24.2
KBCR-1	57	18369	0.2	15.15538	2.0	0.54533	1.0	0.51	2805.7	22.7	2825.1	18.7	2838.9	27.6	2838.9	27.6
KBCR-25	362	55607	0.7	19.26809	1.9	0.60618	1.4	0.72	3054.7	33.9	3055.3	18.7	3055.8	21.4	3055.8	21.4
KBCR-91	275	61632	2.2	21.79035	2.0	0.57593	1.0	0.51	2932.1	23.6	3174.4	19.1	3331.4	26.5	3331.4	26.5

Notes:

1. Uncertainties for individual analyses are reported at the 1-sigma level, and include only measurement errors.
2. Systematic errors are 1.6% for 206Pb/238U and 1.1% for 206Pb/207Pb (uncertainties at the 2-sigma level).
3. U concentration and U/Th are calibrated relative to Sri Lanka zircon standard and NIST SRM 610, and are accurate to ~20%.
4. Common Pb correction is from measured 204Pb.
5. Common Pb composition interpreted from Stacey and Kramers (1975).
6. Common Pb composition assigned uncertainties of 1.0 for 206Pb/204Pb, 0.3 for 207Pb/204Pb, and 2.0 for 208Pb/204Pb.
7. U/Pb and 206Pb/207Pb fractionation is calibrated relative to fragments of a large Sri Lanka zircon of 563.5 ± 3.2 Ma (2-sigma).
8. U decay constants and composition as follows: 238U = 9.8485 x 10-10, 235U = 1.55125 x 10-10, 238U/235U = 137.88
9. Best age is 206Pb/238U age for <1.0 Ga grains and 206Pb/207Pb age for >1.0 Ga grains.