Errata

Variability of apatite fission-track annealing kinetics: III. Extrapolation to geological time scales, Richard A. Ketcham, Raymond A. Donelick, and William D. Carlson (vol. 84, pages 1235–1255, 1999).

The tables reporting predicted geological time-scale behavior of some of the apatite fission-track annealing models presented by Ketcham et al. (1999) contain incorrect values stemming from two errors. First, all estimated closure temperatures (T_C) for annealing models based on mean c-axis projected length ($l_{c,mod}$) are incorrect, due to use of a conversion from mean non-projected length to track density (e.g., Green 1988), rather than a conversion for mean c-axis-projected length (Ketcham et al. 2003, Eq. 7) as a part of the T_C calculation. This error affected Tables 3a, 5c, and 5d in Ketcham et al. (1999). For a 10 °C/Myr cooling rate, the correction lowers the estimated T_C by 12–14 °C for typical F-apatite, and by as much as 45 °C for the Cl-OH apatite B2. Calculations of the other two index temperatures, the fading temperature (T_F) and total annealing temperature (T_A), are not affected by this error. Software including source code for calculating all of these values has been made available as part of Ehlers et al. (2005).

Second, all index temperatures for the individual fits to c-axis projected data for apatites DR and B3 (Table 3a) are incorrect,

as they reflect fitted annealing equation parameters that were revised during the manuscript review process, and were not updated. The differences in all predicted index temperatures are small (1–4 °C).

The tables below replace all incorrect entries. Finally, the titles for Tables 5a-d were incorrectly made identical. The titles for revised Tables 5c and 5d below have been corrected. The title for Table 5a should read "Geological time scale predictions of mean length fanning Arrhenius model (Ketcham et al. 1999, Table 5e, line 1)." The title for Table 5b should read "Geological time scale predictions of mean length fanning curvilinear model (Ketcham et al. 1999, Table 5e, line 2)."

References Cited

Ehlers, T.A., Chaudhri, T., Kumar, S., Fuller, C.W., Willett, S.D., Ketcham, R.A., Belton, D.X., Kohn, B.P., Gleadow, A.J.W., Dunai, T.J., and Fu, F.Q. (2005) Computational tools for low-temperature thermochronometer interpretation. Reviews in Mineralogy and Geochemistry, 58, 589–622.

Green, P.F. (1988) The relationship between track shortening and fission track age reduction in apatite: Combined influences of inherent instability, annealing anisotropy, length bias and system calibration. Earth and Planetary Science Letters, 89, 335–352.

Ketcham, R.A., Donelick, R.A., and Carlson, W.D. (1999) Variability of apatite fission-track annealing kinetics III: Extrapolation to geological time scales. American Mineralogist, 84, 1235–1255.

Ketcham, R.A., Donelick, R.A., and Donelick, M.B. (2003) AFTSolve: A program for multi-kinetic modeling of apatite fission-track data. American Mineralogist, 88, 929 (Abstract). Geological Materials Research, 2(1), Published 15 March 2000, 18 pages, 2 tables, 12 figs.).

TABLE 3A. Index temperatures for lengths for annealing models in Table 3b, Ketcham et al. (1999), mean c-axis-projected length models only (non-projected mean length results in original Table 3a are correct)

Apatite	Data fitted	Model type	$T_{F,100}$ (°C)	$T_{F,30}$ (°C)	$T_{F,10}$ (°C)	$T_{C,1}$ (°C)	$T_{C,10}$ (°C)	$T_{C,100}$ (°C)	$T_{A,1}$ (°C)	$T_{A,10}$ (°C)	$T_{A,100}$ (°C)	$l_{m,low-T}$ (µm)
RN	$l_{c,mod}$	F.A.	115.6	122.3	128.7	111.0	124.8	139.7	131.8	145.5	160.2	15.06-15.67
DR	$l_{c,mod}$	F.A.	127.5	134.3	140.6	124.5	138.6	153.7	143.8	157.6	172.3	
B3	$l_{c,mod}$	F.A.	165.5	172.3	178.6	142.2	156.1	171.0	181.7	195.4	209.8	
HS	$l_{c,mod}$	F.A.	108.7	115.0	120.9	103.8	116.6	130.4	124.2	137.0	150.7	
RN	$l_{c,mod}$	F.C.	82.2	91.3	99.8	79.4	97.2	116.3	101.8	119.9	138.9	14.36-14.94
DR	$l_{c,mod}$	F.C.	92.9	102.0	110.6	92.5	110.8	130.3	112.6	130.9	150.1	
B3	$l_{c,mod}$	F.C.	133.1	142.1	150.5	112.2	129.7	148.5	152.5	170.3	188.8	
HS	$l_{c,mod}$	F.C.	77.2	85.7	93.6	75.3	91.5	109.0	95.9	112.9	130.6	

Notes: F.A. = Fanning Arrhenius model. F.C. = Fanning curvilinear model.

TABLE 5C. Geological time scale predictions of mean c-axis-projected length fanning Arrhenius model (Ketcham et al. 1999, Table 5e, line 3)

Apatite	$T_{F,100}$ (°C)	$T_{F,30}$ (°C)	$T_{F,10}$ (°C)	$T_{C,1}$ (°C)	$T_{C,10}$ (°C)	$T_{C,100}$ (°C)	$T_{A,1}$ (°C)	$T_{A,10}$ (°C)	$T_{A,100}$ (°C)	$l_{m,low-T}$ (µm)	$l_{m,FC}$ (µm)
HS	105.8	112.2	118.3	100.4	113.5	127.6	121.5	134.6	148.6		
RN	114.1	120.5	126.6	112.7	126.3	140.9	129.8	143.1	157.2	15.38	
SC	117.3	123.8	129.9	115.2	128.8	143.4	133.1	146.4	160.6	15.18	
OL	118.5	125.0	131.2	115.0	128.5	143.2	134.4	147.7	161.9	15.49	
WK	119.2	125.8	131.9	117.5	131.2	145.9	135.1	148.5	162.7	15.13	
UN	119.7	126.2	132.4	116.2	129.8	144.4	135.6	148.9	163.2	15.31	
PQ	123.2	129.8	135.9	119.0	132.7	147.4	139.1	152.5	166.8	14.92	
DR	125.6	132.2	138.4	125.9	139.8	154.8	141.5	155.0	169.3		
AY	126.7	133.3	139.5	125.4	139.3	154.2	142.7	156.2	170.5		
FC	155.4	162.3	168.7	144.5	158.7	174.0	171.8	185.7	200.6		
KP	159.0	165.9	172.4	148.9	163.3	178.7	175.4	189.4	204.3		15.67
B3	163.2	170.1	176.6	142.7	156.8	172.0	179.6	193.7	208.6		
TI	233.1	240.5	247.4	177.8	192.5	208.2	250.3	265.1	280.9		
PC	245.4	252.9	259.8	189.1	203.9	219.9	262.6	277.6	293.4		
B2	255.2	262.7	269.7	193.5	208.4	224.4	272.5	287.6	303.5		

TABLE 5D. Geological time scale predictions of mean *c*-axis-projected length fanning curvilinear model (Ketcham et al. 1999, Table 5e, line 4)

Apatite	$T_{F,100}$ (°C)	$T_{F,30}$ (°C)	$T_{F,10}$ (°C)	$T_{C,1}$ (°C)	$T_{C,10}$ (°C)	$T_{C,100}$ (°C)	$T_{A,1}$ (°C)	$T_{A,10}$ (°C)	$T_{A,100}$ (°C)	$I_{m,low-T}$ (μm)	$I_{m,FC}$ (μm)
HS	72.3	81.0	89.1	70.1	86.7	104.6	91.3	108.7	127.0		
RN	80.6	89.4	97.6	81.7	99.0	117.7	99.7	117.3	135.7	14.61	
SC	83.8	92.6	100.9	84.1	101.5	120.2	103.0	120.7	139.1	14.43	
OL	85.1	93.9	102.2	84.0	101.3	120.0	104.3	122.0	140.4	14.70	
WK	85.8	94.7	102.9	86.3	103.8	122.7	105.0	122.7	141.2	14.42	
UN	86.3	95.1	103.4	85.1	102.5	121.2	105.5	123.2	141.7	14.54	
PQ	89.8	98.7	107.0	87.9	105.4	124.2	109.1	126.8	145.4	14.21	
DR	92.2	101.1	109.4	94.3	112.3	131.5	111.5	129.3	147.9		
AY	93.3	102.3	110.6	93.9	111.8	130.9	112.7	130.5	149.1		
FC	121.9	131.1	139.7	112.9	131.2	150.8	141.6	159.9	179.1		
KP	125.5	134.7	143.3	117.2	135.7	155.4	145.2	163.6	182.8		15.14
B3	129.5	138.8	147.5	111.5	129.6	148.9	149.3	167.8	187.0		
TI	196.9	206.7	215.8	145.9	164.6	184.6	217.3	236.7	256.8		
PC	208.3	218.1	227.3	156.6	175.7	195.9	228.8	248.3	268.6		
B2	217.2	227.2	236.4	160.8	180.0	200.2	237.8	257.4	277.8		