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Corrigendum

Corrigendum to "Effect of different ions on dissolution rates of silica and feldspars at high pH" [Cem. Concr. Res. 152 (2022) 106644]

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The authors regret to report an error in the above article in Eq. (3) to calculate the dissolution rates in mol/(m^2·s), originally reproduced from Snelling (2013) [R. Snelling, Solution-controlled dissolution of supplementary cementitious material glasses at pH 13: the effect of solution composition on glass dissolution rates, J. Am. Ceram. Soc. 96 (2013) 2467–2475. doi:https://doi.org/10.1111/jace.12480].

The authors would like to apologise for any inconvenience caused.

Eq. (3) should read as:

$$r_{Si} = \frac{d(X)}{\Delta t} \times \frac{V_{sol}}{m \times S}$$

where $\frac{d(X)}{\Delta t}$ is the change in Si concentration in mol/L within the considered time period (in s), m is the mass of solid (in g), V_{sol} is solution volume (in L), and S corresponds to the initial specific surface area of the powder in m^2/g.

This error resulted in too slow reaction rates by a factor of 4 to 6. The corrected rates are given in several figures and tables below. The error, however, does not influence the conclusions of the article as they focused on the comparison between the different systems.

In addition, Section "3.5.2. Dissolution in diluted solution and based on mass loss" should read as: Lithium did not significantly affect the release rate of Si from albite, quartz and microcline, while for amorphous silica slower Si release rates were measured (Table 3). The lower

Table 3
Dissolution rates of quartz (Q), amorphous silica (AmS), albite (Alb) and microcline (Microc) in different solutions.

Solid	Solution			pH[a]		Storage temperature (°C)	Experiment duration (month)	$r_{Si} \times 10^{-9}$ (mol/(m^2·s))[b,g]
	Alkaline solution	Initial concentration (mM)	Salt	Initial	Final			
Q-1	400 mM KOH	–		12.5	12.5	60	19.7	4 ± 0.8
AmS-1				13.0	13.0	40	8.8	62 ± 7
					13.0		8.5	60 ± 12
AmS-2				12.9	12.9		14.2	48 ± 5
Alb-1				13.0	12.9		14.2	0.4 ± 0.1[c]
Alb-2				13.0	13.1		12	0.2 ± 0.1
Microc				13.0	13.1		12	0.1 ± 0.1
Calcium								
Q-1	400 mM KOH	3	$CaCl_2$	12.5	12.5	60	19.7	<0.4[d]
AmS-1				12.9	13.0	40	8.8	36 ± 14[e]
Lithium								
Q-1	400 mm KOH	40	LiCl	12.4	12.4	60	19.7	7 ± 0.7[f]
		400		12.5			19.7	6 ± 0.6[f]
AmS-2		10	LiOH	12.9	12.8	40	14.2	51 ± 5[f]

(continued on next page)

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Table 3 (*continued*)

Solid	Solution			pH[a]		Storage temperature (°C)	Experiment duration (month)	$r_{Si} \times 10^{-9}$ (mol/(m^2·s))[b,g]
	Alkaline solution	Initial concentration (mM)	Salt	Initial	Final			
AmS-1		40	LiCl	13.0	13.0		8.8	61 ± 8[f]
AmS-2		100	LiOH	12.9	12.8		14.2	38 ± 4[f]
AmS-1		400	LiCl	13.0	13.0		8.8	34 ± 7[f]
Alb-2				13.0	13.2		12	0.2 ± 0.1[f]
Microc				13.0	13.2		12	0.1 ± 0.1[f]
Alb-1		10	LiOH	12.9	12.8		14.2	0.5 ± 0.1[f]
		100					14.2	0.5 ± 0.1[f]
Sulfate								
AmS-1	400 mm KOH	200	K_2SO_4	13.0	13.0	40	10	47 ± 5
		3 + 50	$AlCl_3 + K_2SO_4$				12.4	15 ± 1

[a] The pH values were measured at the experiment temperatures.
[b] Si concentrations were measured using ICP-OES.
[c] Higher dissolution rate, as Alb-1 contains in addition 8 % of quartz.
[d] Precipitation of C-S-H is strongly probable.
[e] Precipitation of C-S-H observed.
[f] Precipitation of Li_2SiO_3 is strongly probable, observed after 5 months of amorphous silica plate dissolution in 400 mM KOH + 400 mM LiCl at 60 °C.
[g] All error bars were calculated with respect to a 95 % confidence interval.

silicon concentrations observed in the presence of Li for amorphous silica could be due to the formation of Li_2SiO_3 (as discussed below and as reported by [27]), which limits the Si concentrations in solution.

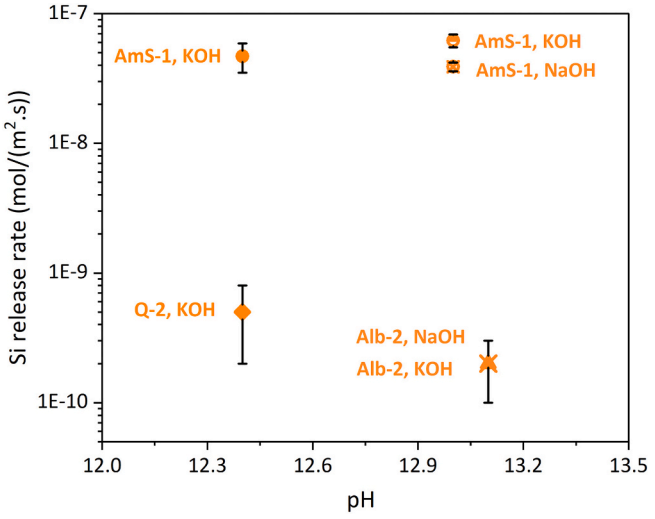

Fig. 2. The Si release rate (mol/(m^2·s)) from amorphous silica (AmS-1), quartz (Q-2) and albite (Alb-2) in different solutions at 40 °C (pH values were measured at 40 °C). All error bars were calculated with respect to a 95 % confidence interval.

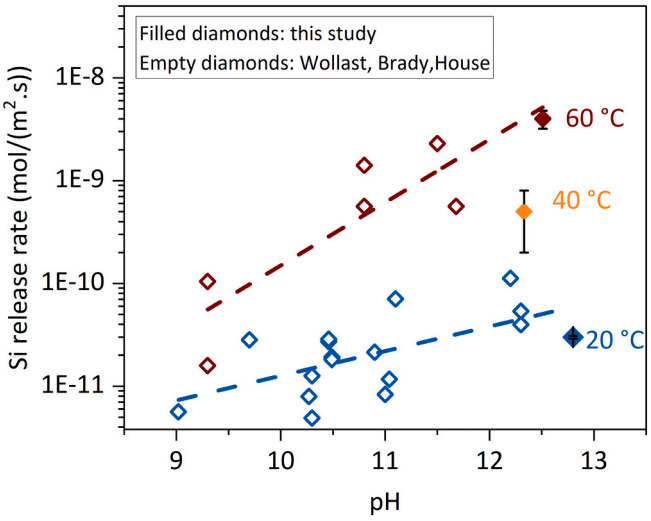

Fig. 3. The Si release rate (mol/(m^2·s)) of quartz (Q) from literature: Wollast and Chou [49]; Brady and Walther [50] and House and Orr [51] (empty diamonds) and the results of this study for quartz (Q-1/2) (filled diamonds) at different temperatures (20–25, 40 and 60 °C) as a function of pH (pH values were reported at the experimental temperatures). The blue color indicates experiments at 20–25 °C, orange at 40 °C and dark red at 60 °C. All error bars for the dissolution rates of the present study were calculated with respect to a 95 % confidence interval. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

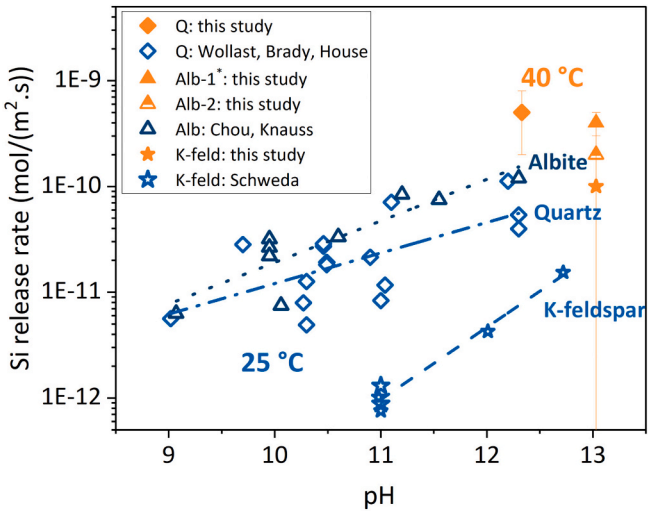

Fig. 4. The Si release rate (mol/(m^2·s)) of quartz (Q), albite (Alb-1/Alb-2) and K-feldspar (K-feld) from literatures (empty dots) at 25 °C [5,49–54] and the results of this study (filled dots) at 40 °C as a function of pH. *Higher dissolution rate, as Alb-1 contains in addition 8 % of quartz. All error bars for the dissolution rates of the present study were calculated with respect to a 95 % confidence interval.

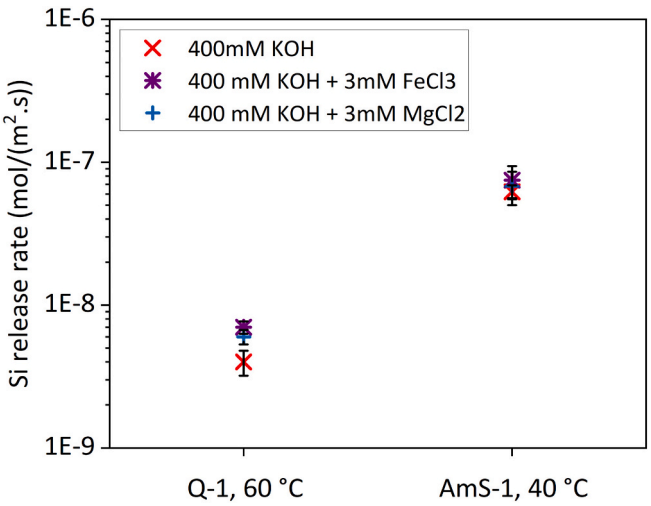

Fig. 11. The Si release rate (mol/(m^2·s)) from a) Q-1 at 60 °C and b) AmS-1 at 40 °C in 400 mM KOH, 400 mM KOH + 3 mM $FeCl_3$ and 400 mM KOH + 3 mM $MgCl_2$. All error bars were calculated with respect to 95 % confidence interval.

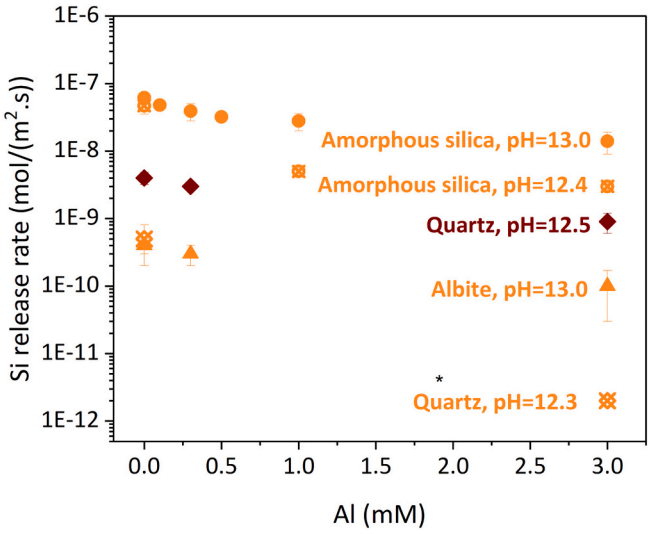

Fig. 5. Si release rate (mol/(m^2·s)) from amorphous silica (AmS-1 at 40 °C), quartz (Q-1 at 60 °C (dark red filled diamonds), Q-2 at 40 °C (orange diamonds with cross sign symbols)) and albite (Alb-1 at 40 °C) (orange filled triangles) as a function of Al concentration in pH 12.3 to 13 (pH values were measured at the experiment temperatures). *The dissolution rate is less than this number. All error bars were calculated with respect to a 95 % confidence interval. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

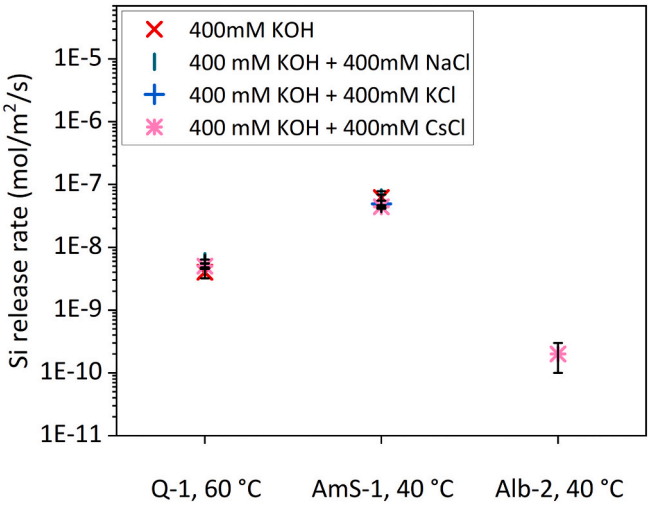

Fig. 14. The Si release rate (mol/(m^2·s)) from Q-1 (at 60 °C) and AmS-1 and Alb-2 (at 40 °C) in 400 mM KOH, 400 mM KOH and 400 mM of NaCl or KCl or CsCl. All error bars were calculated with respect to 95 % confidence interval.

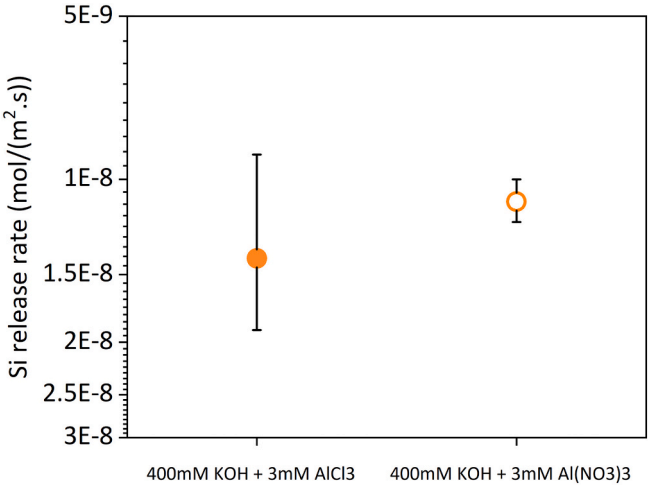

Fig. D1. The effect of counter anions on the dissolution rate of amorphous silica in 400 mM KOH + 3 mM of Al, provided by the addition of $AlCl_3$ or $Al(NO_3)_3.9H_2O$ at 40 °C. All error bars were calculated with respect to a 95 % confidence interval.

Table 4
Dissolution rates of quartz, amorphous silica and albite in different solutions.

Solid	Solution			pH[a]		Storage temperature (°C)	Technique	Experiment duration (month)	$r_{Si} \times 10^{-9}$ (mol/(m^2·s))
	Alkaline solution	Concentration (mM)	Salt	Initial	Final				
Q-1	400 mM	–		12.5	12.5	60	ICP-OES	19.7	4 ± 0.8
AmS-1	KOH			13.0	13.0	40		8.8	62 ± 7
Alb-2				13.0	13.1			12	0.2 ± 0.1
Alb-1				13.0	13.1			14.2	0.4 ± 0.1[b]
Q-2	100 mM	–		12.9	12.8	20	IC	40	0.03 ± 0.001
	KOH			12.3	12.4	40		15	0.5 ± 0.3
AmS-1				12.4			ICP-OES	8.5	47 ± 12
AmS-1	400 mM	–		13.0	13.0	40	ICP-OES	12.4	39 ± 3
Alb-2	NaOH			13.0	13.1			12	0.2 ± 0.1
Aluminium									
Q-2	100 mM	3	Al	12.8	12.8	20	IC	40	< 0.0009
	KOH		$(NO_3)_3$·9H2O	12.3	12.3	40		15	< 0.002
AmS-1		1	$AlCl_3$	12.4	12.3		ICP-OES	8.5	5 ± 0.6
		3						8.5	3 ± 0.3
Q-1	400 mM	0.3		12.4	12.5	60		19.7	3 ± 0.3
	KOH	3			12.4			19.7	0.9 ± 0.3
AmS-1		0.1		13.0	13.0	40		8.8	48 ± 6
		0.3		12.9	12.9			8.8	39 ± 11
		0.5			13.0			8.8	32 ± 5
		1						8.8	28 ± 8
		3						12	14 ± 5
AmS-2			Al		12.9			14.2	11 ± 1
Alb-1		0.3	$(NO_3)_3$·9H2O	12.9	12.9			14.2	0.3 ± 0.1
		3						14.2	0.1 ± 0.07
Iron, magnesium									
Q-1	400 mM	3	$FeCl_3$	12.4	12.5	60	ICP-OES	19.7	7 ± 0.7
AmS-1	KOH			12.9	12.9	40		8.8	75 ± 19
Q-1	400 mM	3	$MgCl_2$	12.4	12.5	60	ICP-OES	19.7	6 ± 0.7
AmS-1	KOH			12.9	12.9	40		8.8	68 ± 18
Extra alkalis; sodium, potassium, caesium									
Q-1	400 mM	400	NaCl	12.5	12.4	60	ICP-OES	19.7	6 ± 0.4
AmS-1	KOH			13.0	13.0	40		8.8	62 ± 16
AmS-1	400 mM KOH	400	KCl	13.0	13.0	40	ICP-OES	10	49 ± 6
Q-1	400 mM	400	CsCl	12.5	12.4	60	ICP-OES	19.7	5 ± 0.5
AmS-1	KOH			13.0	12.9	40		8.8	43 ± 3
Alb-2				13.0	13.1			12	0.2 ± 0.1

All error bars were calculated with respect to a 95 % confidence interval.
[a] The pH values were measured at the experiment temperatures.
[b] Higher dissolution rate, as Alb-1 contains in addition 8 % of quartz.