



Corrigendum

Corrigendum to “Preparation and Characterization of High-Strength Geopolymer Based on BH-1 Lunar Soil Simulant with Low Alkali Content” [Engineering 7(11) (2021) 1631–1645]



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The authors apologize for the erroneous transcription of the average chemical composition data of Apollo lunar soil samples in Table 4. The difference in chemical composition between lunar regolith simulants and actual lunar samples is an important indicator for evaluating their similarity. For comparison, Table 4 lists the chemical compositions of Apollo 12, Apollo 14, Apollo 15, Apollo 16, and other classic lunar regolith simulants. However, the Apollo lunar soil data in the original Table 4 contained errors, which have been corrected in this corrigendum.

It should be noted that the molar ratio of silicon to aluminum (Si/Al ratio) in lunar regolith simulant BH-1 is a key factor influencing the discussion of alkali activation activity in this study. The Si/Al ratio of the BH-1 simulant is 2.23, while that of Apollo lunar samples ranges from 1.40 to 3.05. Since the BH-1 value lies within this range, the error in Table 4 does not affect the main results and conclusions of this work regarding alkali-activated solidification of lunar regolith simulant.

The text was corrected as follows.

(1) In Section 3.1 characterization of BH-1 lunar regolith simulant, the discussion regarding Si and Al content in BH-1 and Apollo lunar samples was revised as follows: The Si/Al molar ratio of the BH-1 simulant is 2.23. Lunar soil composition varies across different regions of the Moon, with Apollo lunar samples exhibiting Si/Al ratios ranging from 1.40 to 3.05, as shown in Table 4. The BH-1 value falls within this range. Considering that Al and Si are the primary elements influencing geopolymer formation, this level of matching is acceptable.

(2) In Section 3.1 characterization of BH-1 lunar regolith simulant, the discussion about TiO₂ content was revised as follows: Another common feature of all lunar regolith simulants is their low TiO₂ content. Both lunar samples and simulants generally have TiO₂ contents ≤ 3.00%. As titanium has minimal impact on geopolymer reactions, potential high-Ti occurrences in lunar soil are not considered in this study. The original statement noting that Apollo 12 lunar soil contained a higher TiO₂ content (7.80%) was based on incorrect data and should be deleted.

Table 4

Chemical composition (wt%) of BH-1, JSC-1 [1], DNA-1 [2] and CAS-1 [3] lunar soil simulants and real lunar soil collected by Apollo projects [4].

Item	Apollo 12	Apollo 14	Apollo 15	Apollo 16	JSC-1	CAS-1	DNA-1	BH-1
SiO ₂	46.30	48.10	46.80	45.00	47.71	49.24	47.79	43.3
TiO ₂	3.00	1.70	1.40	0.54	1.59	1.91	1.00	2.9
Al ₂ O ₃	12.90	17.40	14.60	27.30	15.02	15.80	19.16	16.5
Fe ₂ O ₃	—	—	—	—	3.44	—	8.75	16.7
FeO	15.10	10.40	14.30	5.1	7.35	11.47	—	—
MnO	0.22	0.14	0.19	0.30	0.18	0.14	—	0.3
MgO	9.30	9.40	11.50	5.7	9.01	8.72	1.86	3.0
CaO	10.70	10.70	10.80	15.7	10.42	7.25	8.28	8.8
Na ₂ O	0.54	0.70	0.39	0.46	2.70	3.08	4.38	3.8
K ₂ O	0.31	0.55	0.21	0.17	0.82	1.03	3.52	3.3
P ₂ O ₃ /P ₂ O ₅ ^a	0.40	0.51	0.18	0.11	0.66	0.30	—	0.7

^a Phosphorus content is reported as P₂O₃ for Apollo 12, Apollo 14, Apollo 15, and Apollo 16 [4], and as P₂O₅ for JSC-1 [1], CAS-1 [3], and BH-1.

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(3) Additional distinctions have been made in [Table 4](#). A row for Fe_2O_3 has been added, as some studies report the Fe content in lunar samples and simulants as FeO, while others report it as Fe_2O_3 . The BH-1 simulant is reported in terms of Fe_2O_3 . Similarly, the phosphorus content is reported as either P_2O_3 or P_2O_5 in different sources. These distinctions were not made in original [Table 4](#). They have now been clarified in accordance with the original references [1–4].

The authors sincerely apologize for any inconvenience that may have been caused by these errors.

References

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