Goldschmidt 2025 Abstract
https://doi.org/10.7185/gold2025.27942

Potential and Risk of Sulphide Mineral Contamination of Construction Rock in South Korea

GIL-JAE YIM[1], HYEOP-JO HAN[1], SEON-YONG LEE[2] AND JIN-YOUNG LEE[1]

[1]Korea institute of Geoscience and mineral resources
[2]Korea Institute of Geoscience and Mineral Resources

Civil engineering and construction activities often involve the removal of rock from the earth's surface for human use and the removal of weathered layers to obtain building materials. Where newly exposed rock surfaces contain sulphide minerals such as pyrite, environmental contamination can occur, particularly in or near residential areas. To address this, several methods have been developed to identify rocks with potential for contamination due to surface alteration. These include acid-base accounting (ABA), modified ABA, carbonate neutralisation potential tests, humidity cell tests, column tests, batch reactor (shake flask) tests and field tests [1][2].

Research on aggregates and rocks indicates that rock samples are more likely to be acidogenic than aggregate samples. Among rock types, gneiss, granite and schist have the potential for acid generation, in that order. This suggests that aggregates, which are commonly used in large construction projects, may be less susceptible to acid formation than stones, which are mainly used on building surfaces. However, both aggregates and stones contain samples with acid-generating potential, posing a risk of environmental pollution. The development or quarrying of areas containing such stones can affect the surrounding environment and their intended use. It's therefore important to manage these areas and it's advisable to investigate any sulphide mineral contamination in advance and take appropriate action.

This proactive approach can help mitigate potential economic losses in the future, while reducing environmental pollution problems in nearby areas. By understanding and addressing the acid-generating potential of rocks, construction practices can become more sustainable, balancing human needs with environmental protection.

[1] Orava, D., 1997, “In-Pit Disposal for ARD Control, in Short Course Notes on Waste Rock Tailings Disposal Technologies for Reactive Waste Management”, 4th. International Conference on Acid Rock Drainage, Vancouver, B.C. Canada.

[2] USEPA and Hardrock Mining, 2003, “A Source Book for Industry in the Northwest and Alaska”, Appendix C; Characterization of Ore, Waste Rock, and Tailings, C1-C17.