

Supplementary information of the article:

Potential uses of artisanal gold mine tailings, with an emphasis on the role of centrifugal separation technique

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This supplementary information contains:

- Five pages
- One supplementary data
- One figure
- Eight references

Supplementary information on the Miyove gold mine

Regional geology

The Miyove gold mine (2,937 hectares) is located in the northern part of the Kibara intercontinental orogenic belt. The orogen stretches SSW to NNE for about 1500 km, from Katanga in the Democratic Republic of Congo, in the south, to southwestern Uganda, in the north. The width of the belt reaches 500 km at its widest, west of Lake Victoria. The orogen has a long and complex evolution, from the Mesoproterozoic through to the Neoproterozoic. It formed part of a series of long-lived Mesoproterozoic intracratonic sedimentary shallow water basins (aulacogens), which had been developed on the Palaeoproterozoic (Archaean) basement between the Congo and Tanzania cratons. It is dominated by folded and metamorphosed sediment, mainly schist and sandstone (quartzite), with minor shale, carbonates, volcanics, and conglomerates [1–5].

Local geology

The gold mine is located within the axial part and the eastern limb of the narrow Miyove synclinorium, which strikes NNW for more than 50 km with a limb width of about 11 km [6]. It is composed of at least three main lithological units, with the dominance of sandstone, siltstone, and claystone. The rocks are often altered into quartzite, phyllite, and shale. The rock sequence is folded into narrow symmetrical synclines and anticlines striking NW with limb amplitudes of 200–400 m and 30 to 60° dip angles [7]. Two systems of faults controlling gold mineralisation in the Miyove area are recognized. For example, the Baredaga and Masogwe occurrences are located along the NW striking main shear zone, composed of a system of sub-parallel en-échelon faults and fissure zones. These faults coincide with the direction of the fold axes, which may indicate that NW faults were formed syngenetically with the folds. The secondary N–S system of faults was recognized by alteration patterns such as silicification and haematite oxidation and the N–S orientation of some artisanal mines. Often, mineralization is controlled by the intersection of NW and N-S faults [6,7].

Artisanal gold mining

Since beginning of the 20th century the Miyove area has been explored by artisanal miners who work as private individuals and cooperatively [8]. Artisanal pits are usually shallow, not more than 5 to 7 m in depth. However, in some areas the miners use underground galleries to follow rich gold mineralization (Supplementary Figure S1).



Supplementary Figure S1. Photos showing local gold processing method during sampling (left) and pits excavated by artisanal miners (right).

Reference A.

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