

## **Distribution of nickel and cobalt in the Berong laterite deposit, Palawan, Philippines**

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Intensive weathering of serpentinitized peridotite in Berong, Palawan resulted to the formation of laterite deposit containing significant amount of nickel (Ni) and cobalt (Co). Bulk Ni and Co concentrations reach up to 7.77 wt% NiO and 0.84 wt% CoO, respectively. The laterite profiles are subdivided from bottom to top: (i) serpentinitized peridotite bedrock, (ii) saprolite horizon and (iii) limonite horizon. The ore mineral assemblage includes serpentine, goethite, garnierite and Mn-oxyhydroxides. Several types of serpentine veins were identified, and each type exhibits distinct texture. Goethite occurs as fibrous, massive blocks and often intimately mixed with hematite. Garnierite shows white to pale green coatings with banded and botryoidal features. Co-bearing Mn-oxyhydroxides are dark, fine-grained, locally fill the spaces and cemented by goethite. Cobalt is mainly hosted by lithiophorite-asbolane intermediate with strikingly high contents of Co and Mn (avg. 13.14 wt% CoO; 38.72 wt% MnO). In addition, considerable amount of Ni occurs in these phases (avg. 19.49 wt% NiO). However, it was not deduced if the original Mn mineral was lithiophorite. The abundance of gibbsite may influence the formation of lithiophorite as it requires high intake of aluminum (Al). Gibbsite typically envelopes the massive and porous goethite. Cobalt is particularly high in the lower section of the limonite, whereas Ni is preferentially enriched in the saprolite. In this study, the pH of the weathered horizons ranges from 5.65-7.69, indicating a mild acidic to alkaline environmental condition. The remobilization and transportation of these elements to the deeper sections of the laterite profiles is attributed to the change in pH.