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Geometallurgy of Lithium Primary Resources in DRC : A review

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Lithium demand has increased significantly and has been included in the list of strategic and critical elements such as cobalt, copper, niobium, and tantalum. Lithium is an important element in the low-carbon energy transition that is gradually replacing polluting fossil fuels and used in Li-Ion batteries for Electric Vehicles (EV) and in some electronic components. The large primary lithium resources are located in geologically complex deposits (Li-Cs-Ta) in the form of pegmatite, where lithium is considered a secondary metal and associated to tin, beryllium, Ta, Nb and Fe. Its geological variability presents a major challenge for its beneficiation, which consists in concentration by flotation or not, followed by conversion by heating to 900°C to transform the alpha form into soluble beta, and finally to produce lithium carbonate. This study aims to understand the different facets of lithium extraction in the Democratic Republic of Congo by examining the geological and geochemical context of the Manono deposit, the geometallurgy methodology and shows the strategies for optimal spodumene processing routes and an assessment of the economic viability of this deposit.

Keywords: Geometallurgy, spodumene, pegmatite, lithium, Manono, **energy transition**