

## NOVEL COLLECTOR DEVELOPMENT FOR NICKEL FLOTATION

By

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### ABSTRACT

The growing interest in the decarbonization of the production of energy in support of the goals to limit the increase in global temperatures is expected to lead to an increase in the demand for multiple minerals that are critical to enable a lower carbon future. While historically 70% of the nickel metal produced globally is used in the stainless steel market, dominated by ferronickel and nickel pig iron (NPI), the use of nickel in rechargeable batteries is expected to change this dynamic as nickel-containing batteries are increasingly being used across many industries. In fact, the demand for nickel from the battery industry is expected to reach about 570 Kt by 2025, which is 10 times more than the demand in 2019. This increase in demand is fuelled by the fast-growing use of nickel-containing batteries in electric vehicles (EVs), and this will push mining companies, battery manufacturers and original equipment's manufacturers (OEMs) to re-evaluate their strategies to meet the expected increase in market demand.

This paper discusses the future of nickel, including nickel demand dynamics, the predicted trends of nickel production, methods of beneficiation of different nickel ores, evolution of the annual nickel extraction for different ore types, and ore grade evolution in some leading nickel producing regions. In addition, the paper will introduce novel collectors developed by Clariant for the selective flotation of nickel sulfide ores that are more sustainable than the xanthate collectors often used for beneficiation of these ores. The laboratory flotation results with the novel collectors show significant improvements in nickel flotation recovery and grade compared to traditional SIPX and SIBX xanthate collectors.

*Keywords: Low carbon technology, Clean energy, Climate action, Nickel Ores, Flotation, Electric Vehicle, Batteries, Nickel sulphide, Sustainable collectors.*