CASE STUDY

TALC IN FLOTATION – Talc Depressants

Mitigating naturally hydrophobic minerals and associated impurities

Abstract

Talc (MgO) is a mineral that presents a major challenge in flotation. The surface of talc particles are naturally hydrophobic and talc is easily collected through flotation. Processing aids can be used in flotation to 'coat' the talc and reduce talc in flotation concentrate. A customer recently asked us to determine appropriate processing aids to reduce talc and associated impurities in flotation concentrate. This case study summarises our work with this customer.

Introduction

Kemtec Mineral Processing Pty Ltd (part of the Sinoz Group) is a company that assists Sinoz Group companies to make quality reagents for the mineral flotation sector.

Recently a customer identified issues with talc and associated impurities in some of their flotation concentrates. They approached Kemtec to assist in providing reagents to depress talc in certain problematic ores.

Kemtec have a wide range of processing aids designed to selectively negate naturally hydrophobic minerals.

Armed with this knowledge, a team performed site-based laboratory work with selected processing aids to identify a way forward for the customer.

Methodology

Kemtec technicians performed site-based work to produce recovery plots to demonstrate the effect of two key processing aids. The processing aids selected were Kemtec 811 and 879 (see Figure 1).

Figure 1: On site test work and support

Results

With access to the customer's full metallurgical laboratories, the site test work involved flotation tests that produced various grade / recovery curves. The test work was also conducted with statistical tools aimed at gauging confidence levels in the analyses.

Two problematic ore types were identified and used for the purposes of comparing the efficacy of the two Kemtec processing aids.

Both processing aids, 811 and 879, were added at dose rates between 150-500g/t (with the 500g/t results shown in Figure 2). The baseline in Figure 2 is one of the problematic ores. Similar results were obtained for the other problematic ore.

Figure 2: MgO vs Cu Recovery Improvement.

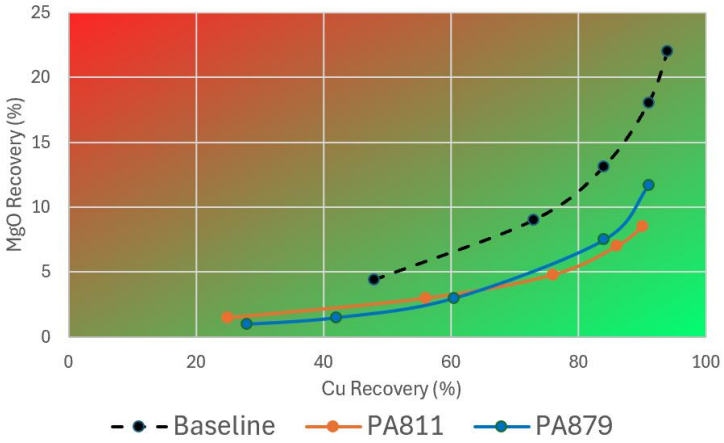

Figure 2 shows that adding either processing aid achieved success in reducing the MgO recovery at any given Cu recovery.

In this case, additional test work was done on impurities associated with the talc that cause concentrate to trigger penalties from the end user of the concentrate. By adding either processing aid both the talc and the associated concentrate impurities were halved.

Further on-site full-scale plant work is planned to determine which processing aid offers the most efficient method of reducing talc.

Conclusion

Kemtec and our team of dedicated technologists were able to assist in mapping out two solutions to the issue of talc in flotation.

We understand that reagents are one toolkit that can be used to deal with problematic ores. Blending and selective mining are also useful. The Sinoz Group works to ensure that all methods are evaluated and that customers are given the right data-based decision making information to best manage their plants.

While this test work may have been performed in Melbourne at Kemtec's laboratories, this case study shows the strength of a true partnership that allows our customers the confidence to know that we are here to help and that we will step up.

If you have any questions or if you would like to understand more about Kemtec and the Sinoz Group, please reach out on the numbers/emails below.

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