

SUMMARY

Background

The Moina fluorite deposit of Comalco Limited contains low-grade fluorite mineralisation with magnetite. Minor concentrations of scheelite and cassiterite are present.

Preliminary mineralogical examination has shown that grinding to at least 30 μm is required to liberate the fluorite.

Exploratory leaching tests indicated that chemical extraction of the fluorine was feasible but would require prior elimination of magnetite. Following this work the company authorised a preliminary investigation into the physical beneficiation of the ore.

Objectives

The objectives of the investigation were:

1. To produce an acid grade fluorite concentrate at maximum recovery or a lower-grade concentrate suitable for chemical treatment;
2. To make separate magnetite, cassiterite and scheelite concentrates.

Summary of Work Done

The investigation was carried out using a composite ore sample prepared from 148 drill-core samples representing four diamond drill holes in the Moina deposit.

A detailed mineralogical examination was carried out to determine the nature and association of the minerals present and their liberation characteristics.

Flotation tests were carried out on the raw sample and on material which had been subjected to magnetic separation for removal of magnetite. Magnetic separation of the flotation concentrate was also investigated. Other aspects of flotation examined were regrinding of flotation concentrate before further cleaning and the use of Quebracho to depress calcite.

Conclusions

1. By fine grinding and flotation a concentrate assaying 92.5% CaF_2 with a recovery of 45.7% was produced from a feed assaying 16.5% CaF_2 .
64.9
2. Removal of magnetite by magnetic separation applied to either the flotation feed or concentrate resulted in a high loss of fluorite due to the poor liberation characteristics of magnetite.