6. DISCUSSION

6.1 Magnetic Separation

Fluorite losses were high when magnetic separation was employed. The loss was reduced to 23.8% in Test 4 compared with 33.6% in Test 1 due to the finer grind employed in the former test.

In Test 5 which employed the same feed sizing as Test 4, fluorite losses increased to 31.2% when magnetic separation was applied to the final concentrate instead of the flotation feed.

6.2 Regrind

Regrinding of the rougher concentrate before cleaning resulted in a considerable improvement in selectivity and this can be seen readily from the comparisons given in Fig. 1.

6.3 Depression of Calcite

In the final cleaning stages of Test 8 it was evident from Fig. 1 that substantial fluorite losses were incurred in seeking higher concentrate grades (maximum 88.4% CaF_2).

Mineralogical examination (see Appendix B) shows that the main diluent in the final concentrate was well liberated calcite.

The use of Quebracho in the cleaning stages of Test 9 was effective in depressing most of the calcite and improving the overall cleaner flotation response (refer to Fig. 1). Assay of the final cleaner concentrate in this case using the normal specific ion electrode method gave 92.5% CaF_2. This compares with 93.1% CaF_2 by check titration method.

The obvious benefit gained in the cleaner flotation response as a result of employing Quebracho in the third and sixth cleaning stages in Test 9 justifies further work into the investigation of its use in the primary and secondary grinding stages. Benefits likely to result in this case are:

(a) Overall improvement in the flotation response.

(b) Lower collector requirement.

6.4 Iron Contamination

The results of Tests 8 and 9 show a minimum iron value in the final concentrate of 1.4% Fe. This arises due to the fact that despite the fine sizing of the concentrate (nominally minus 15 μm) there is a significant amount of magnetite present, mostly composite with the fluorite which cannot be removed without affecting the fluorite recovery.