

5. EXPERIMENTAL PROCEDURE AND RESULTS

5.1 Magnetic Separation

A sample of ore was ground to minus 100 mesh and sub-samples treated in a Davis Tube magnetic separator. The feed sizing is given in Table 2 (10 min. grind). Test conditions and results are given in Table 3.

5.2 Magnetic Separation and Flotation

All flotation tests were carried out at 40°C and circuit water used was demineralised.

Test 1. A 500-g charge was ground to minus 100 mesh and separated in an Eriez wet drum magnetic separator at a field strength of 1000 gauss. The results are shown in Table 4.

The non-magnetic fraction was treated by rougher flotation using a fatty acid collector. The flotation conditions and overall magnetic separation-flotation results are given in Table 5.

Test 4. This test was carried out using a finer feed grind of 100% passing 170 mesh (15 min. grind, Table 2). After magnetic separation the non-magnetic products were floated to five rougher stages for high recovery, and the combined concentrate was then cleaned three times. The test conditions and results are detailed in Table 6.

Test 5. This test was carried out at the finer feed sizing used in Test 4. Sodium silicate was added to the mill and magnetic separation was applied to the third cleaner concentrate instead of the flotation feed. Test data and results are presented in Table 7.

5.3 Flotation Without Magnetic Separation

Because of the high fluorite losses associated with the magnetic separations in the above tests, magnetic separation was not included in the following tests:

Test 3. The coarser feed grind of 100% minus 100 mesh was employed in this test. Three rougher concentrates were collected, combined and cleaned once. Test details and results are contained in Table 8.

5.4 Flotation with Regrind of Cleaner Feed

Test 6. In this test the combined rougher concentrates were cleaned once and the cleaner concentrate reground before cleaning a further three times. The results of this test together with the procedure are included in Table 9.