

flotation means.

(b) Flotation extraction of fluorite:

Aim and methods

The aims were:

- (i) to produce an acid grade fluorite concentrate at maximum recovery;
- (ii) to study the feasibility of extraction of magnetite, cassiterite and scheelite.

A quotation was received from Amdel and the Colorado School of Mines for an initial beneficiation study of the Moina wriggilite. Amdel's quote was accepted because

- (i) it was cheaper;
- (ii) they had previously carried out beneficiation work on the Mt. Garnet wriggilite; and
- (iii) liaison with Amdel as work proceeded would be easier.

A bulked sample of crushed split core from drill holes SMD 4, 5, 6, 7 was made up according to a recipe, as listed in Appendix 29. The sample contains both wriggilite and calc-silicate rock. The overall fluorite content was 16%, and Sn was 0.13%, WO_3 - 0.11%.

Full details of the mineralogical studies, magnetic separations and flotation testing are in Amdel's final report No.1147 (Feb 1977), in Appendix 29. (Data from Amdel's preliminary report and progress reports 1 and 2 are all covered in the final report and so only the final report is reproduced here).

Results

Full results of testing are in Amdel's final report in Appendix 29.

Amdel's final conclusions are:

- (i) By fine grinding and flotation a concentrate assaying 92.5% CaF_2 with a recovery of 64.9% was produced from a feed assaying 16.5% CaF_2 .
- (ii) 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.
- (iii) Grinding to 17 μm is necessary for good liberation of fluorite. Scheelite is well liberated at flotation sizes but little cassiterite is liberated above 9 μm . Much of the magnetite is liberated at 33 μm but finely disseminated magnetite is evident in grains finer than 15 μm .