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FLUORIDE EXTRACTION FROM FLUORITE

1. INTRODUCTION

In response to a letter from Amdel, Dr J.C. Nixon visited Thebarton for a brief discussion on 13 January 1976. Mr J. Gooden explained that Amdel had done laboratory work at its own expense on a novel process for fluorine extraction from difficult ores. Before divulging details of the process and discussing possible Comalco support of further development, it was suggested that Amdel test, for minimum cost, the response of a sample of Comalco's Moina fluorite ore to the Amdel process. A firmer basis would then exist to discuss Comalco support of further development of the process.

Mr A. Bartlett, Exploration Manager of Comalco Limited then supplied two samples of siliceous fluorite ores from the Moina area of Tasmania. Only the first sample, Moina 1, could be tested within the money approved for the work. The behaviour of tin, present in the ore up to a level of 0.5%, was also of interest.

2. MATERIAL EXAMINED

The ore sample supplied was split into halves and one half ground to pass a 100 mesh BSS screen. An assay sample was riffled from the minus 100 mesh ore and analysed chemically for fluorine, silica and tin. The results are tabulated below, along with those reported by the client. A more comprehensive analysis provided by Comalco Limited is included as Table 1.

Component	percent by weight	
	Comalco	Amdel
F	12.3	12.2
SiO ₂	20.0	23.4
SnO ₂	nr	0.215

3. EXPERIMENTAL PROCEDURE AND RESULTS

Three experiments were conducted at laboratory bench scale, in which the Moina 1 ore (12.5 g) was reacted in the Amdel process for one, two and three hours. The residue was chemically analysed for fluorine, silica and tin. The results are shown in the following table:

Expt. No.	Reaction Time (hr)	% F in residue	Residue wt. (g)	% of Total Component in Residue		
				F	SiO ₂	SnO ₂
1	3	3.60	18.45	44	79	96
2	2	3.55	18.77	44	81	93
3	1	3.55	18.75	44	80	96

Clearly, the time of reaction was not a limiting factor in these experiments, since in each case, 56% of the fluorine was extracted, along with 20% of the