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HYDROMETALLURGY OF COPPER SULPHIDES BIBLIOGRAPHY 1976-77

by

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CONTENTS

SUMMARY

Background

The bibliography compiled in this Report is part of a continuing investigation of the technical and economic feasibility of establishing in South Australia a facility for treating copper sulphide concentrates. Since 1970, Amdel has been commissioned by the South Australian Department of Mines to investigate the feasibility of establishing a central copper smelter, to determine a suitable hydrometallurgical process and examine its feasibility, to test concentrates from Kanmantoo and Mount Gunson by this process, and to examine *in situ* leaching of copper sulphides in the Moonta and Wallaroo mines.

Objectives

The aim of the present work was to compile a classified bibliography of 1976-77 publications relating to hydrometallurgical processing of copper sulphides to keep the Department of Mines informed on all technical developments in this field.

Summary of Work Done

A literature search was carried out with the aid of the Science Citation Index of the National Library and CSIRO's computer search of Chemical Abstracts. Manual searches were made of Engineering index and IMM Abstracts. A total of 108 articles are listed in the bibliography. These may be sub-divided as follows:

Leaching of copper sulphides.	60
Roasting processes for copper sulphides.	7
Electrolysis of copper sulphide pulps.	3
Solvent extraction of copper from aqueous solutions.	15
Ion-exchange processes for copper.	2
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1. INTRODUCTION

Since 1970, Amdel has examined various possibilities for treating copper sulphide concentrates from South Australian mines. In Hopton and Gooden* (1970) it was shown that a central copper smelter to handle the total output of concentrates from South Australia would not be economically viable.

In 1974 Walker *et al.*† carried out a literature review of hydrometallurgical processes for treating copper sulphides and indicated that a Roast-Leach-Solvent-Extraction-Electrowin process would be the most suitable. In addition, an economic feasibility study indicated that such a plant, built in conjunction with facilities already available in South Australia, would have a return on new capital sufficient to warrant a more detailed study.

In 1976 McMahon and Walker§ tested concentrates from Kanmantoo and Mount Gunson using the recommended process. Severe difficulties were experienced in operating the fluid-bed roaster using Mount Gunson concentrates, while disappointing results were obtained with the Kanmantoo concentrates. Accordingly, a different process is required.

Also in 1976 (Allen, R.J.)¶ investigated the feasibility of recovering copper from sulphide minerals in the Moonta and Wallaroo Mines by *in situ* leaching, but the prospects were not very good.

As part of a continuing effort to establish a copper concentrate processing plant, the South Australian Department of Mines commissioned Amdel to compile a classified bibliography for 1976-77 of articles relevant to the hydrometallurgical treatment of copper sulphides. This study is aimed at keeping the Department abreast of all technical developments in this field.

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¶ALLEN, R.J. (1976). Moonta and Wallaroo Mines Prospects for *in situ* Leaching. Amdel Report No. 1132, July.

2. SOURCES OF INFORMATION

The Science Citation Index of the National Library was used during 1976 to provide a computer search for relevant articles. From September 1976, the CSIRO computer search of Chemical Abstracts was used. In addition, manual searches were made of the Selected Annotated Titles published by the AMF, Engineering Index and IMM Abstracts.

3. BIBLIOGRAPHY

The first section of the bibliography deals with processes relating especially to copper sulphides. The second section contains articles relating to the further processing of copper-containing liquors, irrespective of the original source of the copper. These processes include solvent extraction, ion exchange and electrowinning.

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3.1.1 Leaching

3.1.1.1 General leaching processes

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