

RESEARCH DIRECTIONS

Sonicated Mud

Associate Professor Chin Leo from the School of Engineering, Dr Gary Dennis and Research Fellow Dr Paul Emseis from the School of Natural Sciences in collaboration with the CSIRO are researching the use of high power ultrasonics in mineral and materials separation processes for red mud slurries, a waste product of aluminium ore processing. This research is supported by the Commonwealth Scientific and Industrial Research Organisation through its Flagship Collaboration Research Fund.

'Valuable minerals and materials are extracted from raw materials using a variety of processes such as crushing or grinding or by using a "wet high intensity magnetic separators" process (WHIMS)' explains Associate Professor Leo. 'When processing bauxite (aluminium ore) to make alumina, which is processed to make aluminium, a red mud slurry is produced as a waste residue. Disposing of this is a problem and there are also materials that can be recovered from this so-called "waste". Red mud clay contains clay haematite (mineral iron-oxide) as well as alumina, titanium, silicon and low-iron clay. This research will develop a more comprehensive understanding of the chemical and mechanical mechanisms controlling the composition and properties of red mud residues that have been subjected to forms of processing.'

A high power sonification process (very high frequency sound vibrations) will be used to separate the haematite from the mud and then a WHIMS process will be used to recover more of the magnetic part and other useable products of the mud. The difficulty or ease of these extractions will be examined in detail, as will the changes the mud residues undergo as a result of processing enabling a refinement of the whole process will be implemented.



By further processing red mud residues, the volume of waste from ore-processing is minimised and valuable products from the waste can be recovered. This research may lead to the development of a processing plant that will contribute to the advancement of the Australian ore refining and processing industry.

Project Title: Characterisation of high power sonicated and WHIMS Bayer red mud residues.

Funding has been set at: \$270,007

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In memory of Dr Anthony Collings, valued CSIRO project researcher and colleague.