

Designing starches for increased productivity in mineral flotation

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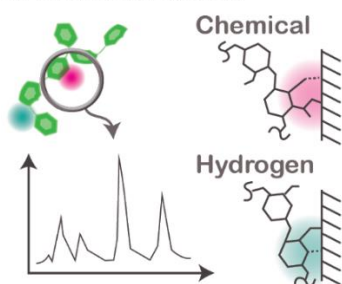
This project is funded by the ARC and Shoalhaven Starches (a subsidiary of Manildra Group).

Froth flotation plays an important role in resource extraction by providing an economical way to separate minerals. Collectors (types of surfactants) are added to make target minerals hydrophobic and float, while depressants are added to make other minerals hydrophilic and sink. However, the minerals industry currently confronts increasing challenges in efficiently rejecting iron minerals in the flotation of base-metal sulphide ores, phosphate ores and iron ores, and rejecting silicate minerals in the flotation of talcaeous and clayey ores. Starch (comprised of natural polysaccharide polymers) has been used previously to reject these minerals and shows significant potential to expand its role in flotation reagents due to its chemical versatility, low cost and minimal environmental impact. In this project, the resources of Manildra Group and UQ will combine to innovate modified wheat starch structures with enhanced selectivity that improve the flotation efficiency of these ores.

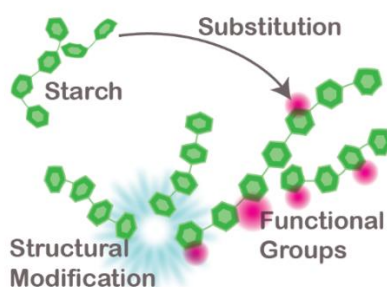
To this end, the project pursues characterisation, manufacturing and performance streams of research to:

- Develop modified wheat starch depressants to selectively reject carbonaceous matter in the flotation of base-metal sulphide ores;
- Develop modified wheat starch depressants to selectively reject talc in the flotation of talceous ores;
- Develop modified wheat starch flocculants to selectively reject clay minerals in the flotation of clayey ores.

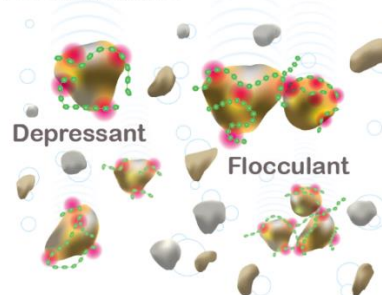
1. Characterisation



2. Manufacturing



3. Performance



Three PhD students and one research fellow work with five other leading academics from polymer engineering, minerals processing and food science backgrounds as part of this project. There are opportunities for undergraduate thesis and summer students to also work on the project.

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