Designed Collectors for Selective Flotation of Sulfide Minerals

Project leader
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Partners
Boliden Mineral AB, Clariant AB

Project duration
2024.01.01 – 2025.06.30

SWEDISH MINING INNOVATION

Med stöd från
VINNOVA Sveriges innovationsmyndighet
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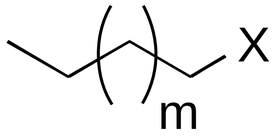
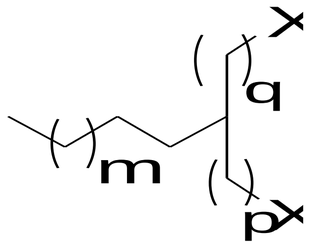
Goals of the project

A usual collector has a head group and a tail, for example-



Our molecules, instead, has two head groups placed at a suitable distance.



The novel collectors

When is geometrical match between the collector head groups and the adsorption sites on the mineral interface, very strong and mineral specific adsorption takes place.

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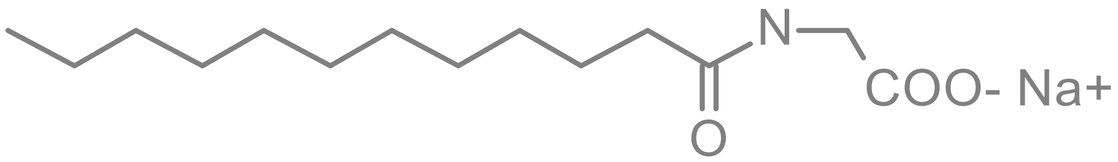
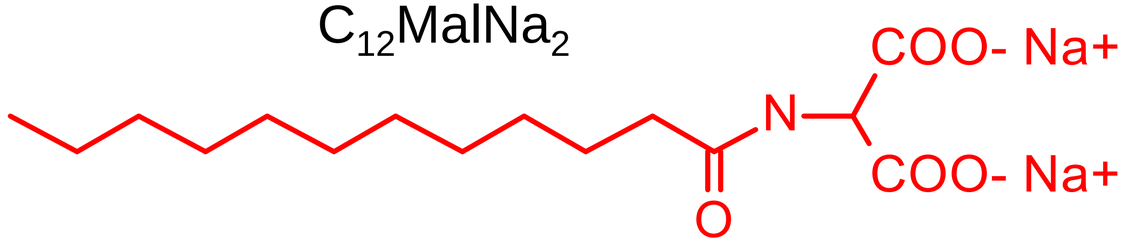
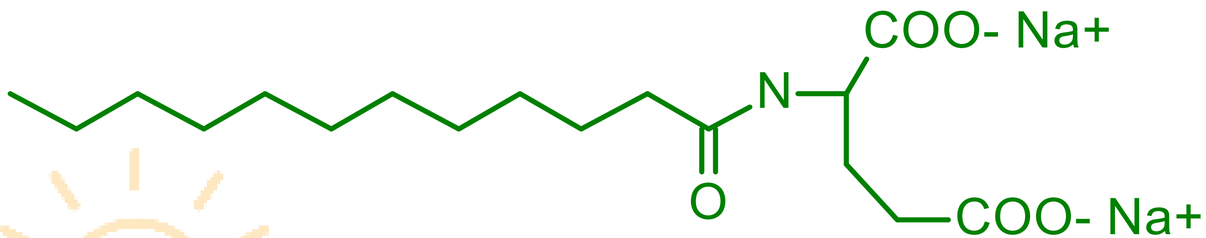
The synthesized collectors

$C_{12}GlyNa$

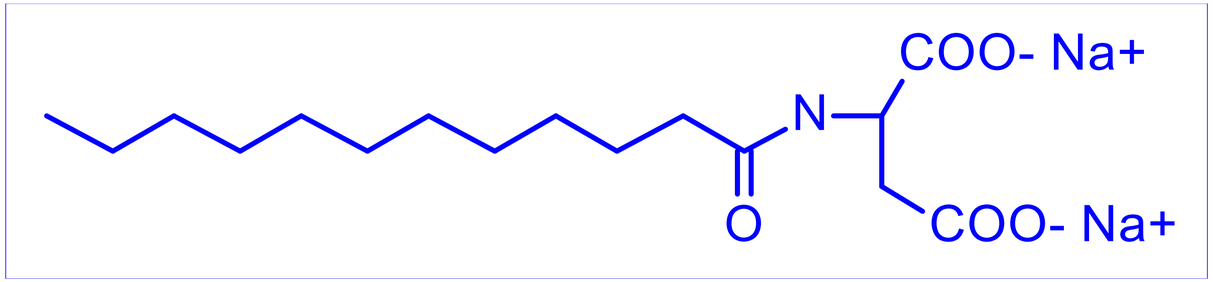


$C_{12}MalNa_2$





$C_{12}GluNa_2$



$C_{12}AspNa_2$

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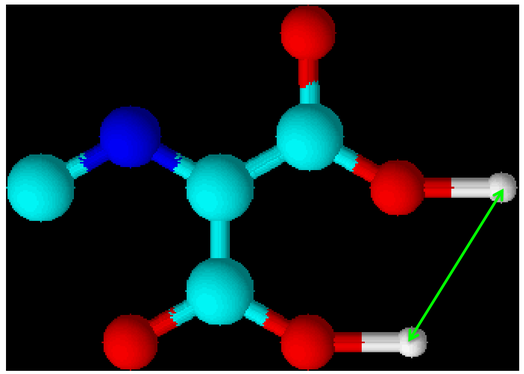
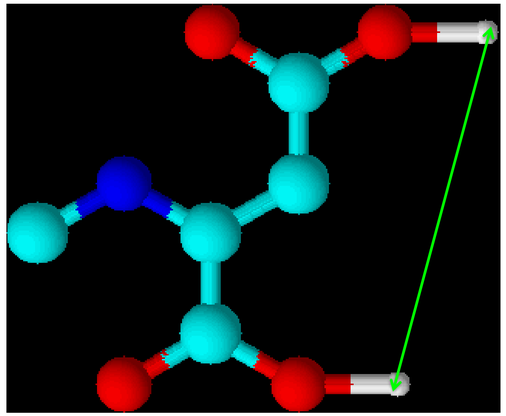
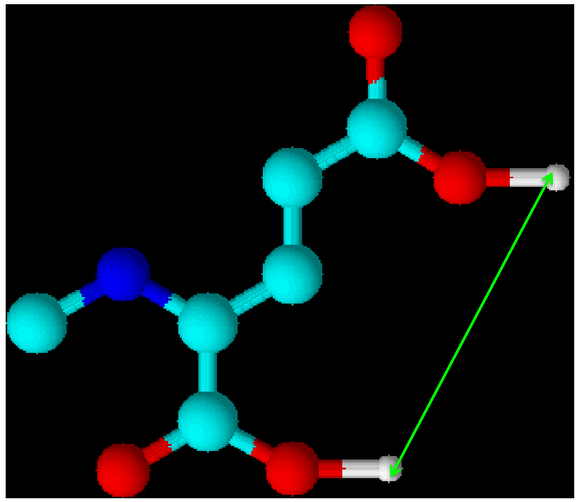
Highest possible distance

Collector	$C_{12}MalNa_2$	$C_{12}AspNa_2$	$C_{12}GluNa_2$
Distance (Å)	3.670	6.153	6.212







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Highest possible distance

Collector	$C_{12}MalNa_2$	$C_{12}AspNa_2$	$C_{12}GluNa_2$
Distance (Å)	3.670	6.153	6.212

Maximum distance between head groups in the double-headed collector molecule

Mineral	Apatite	Calcite	Fluorite
Distance (Å)	3.425	4.048	3.683
	5.425	4.990	5.463

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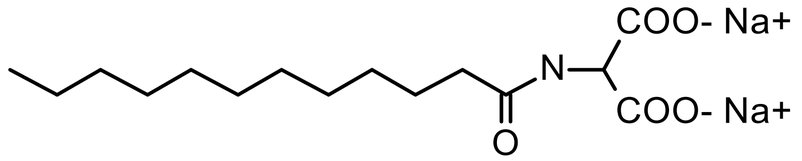
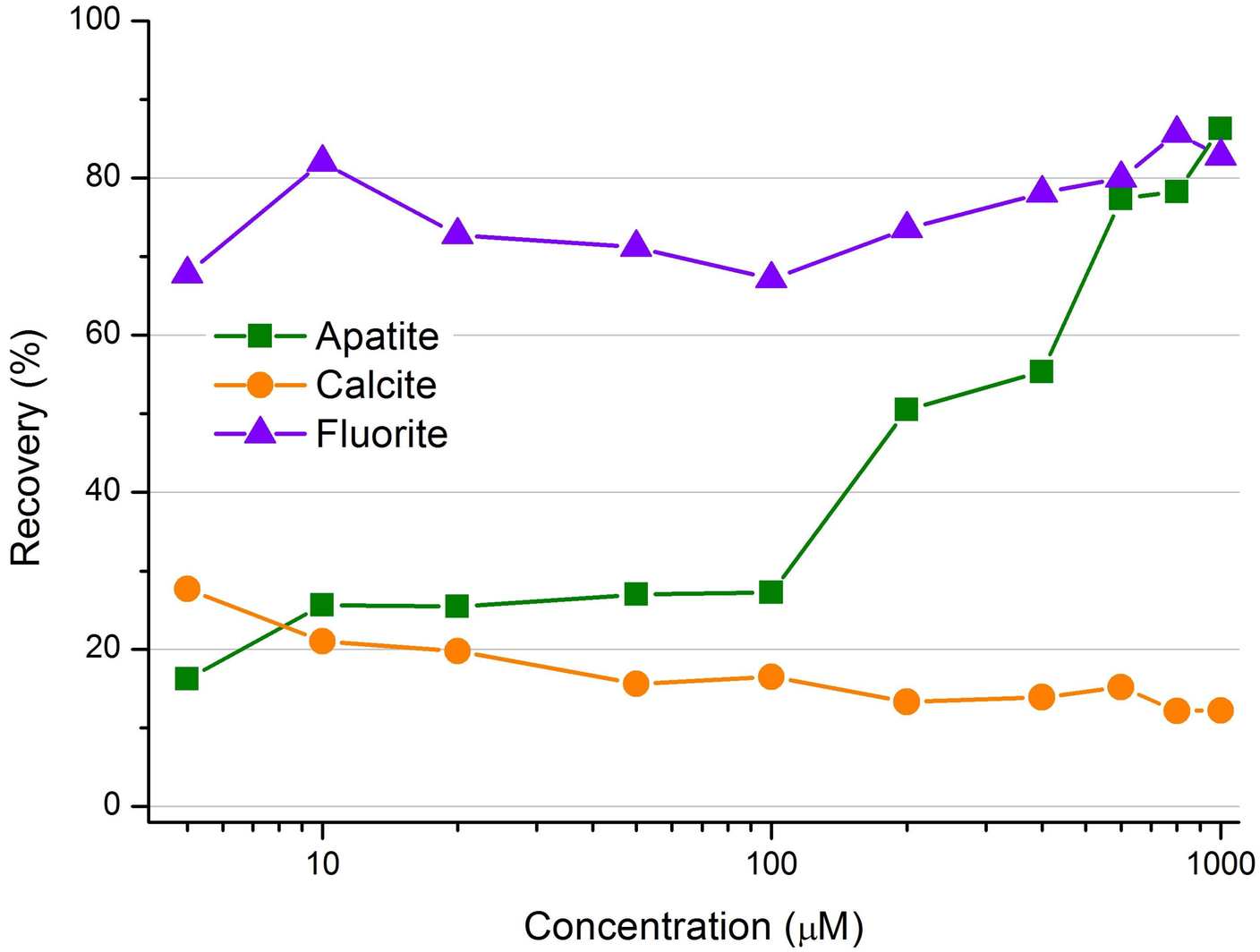


$C_{12}MalNa_2$



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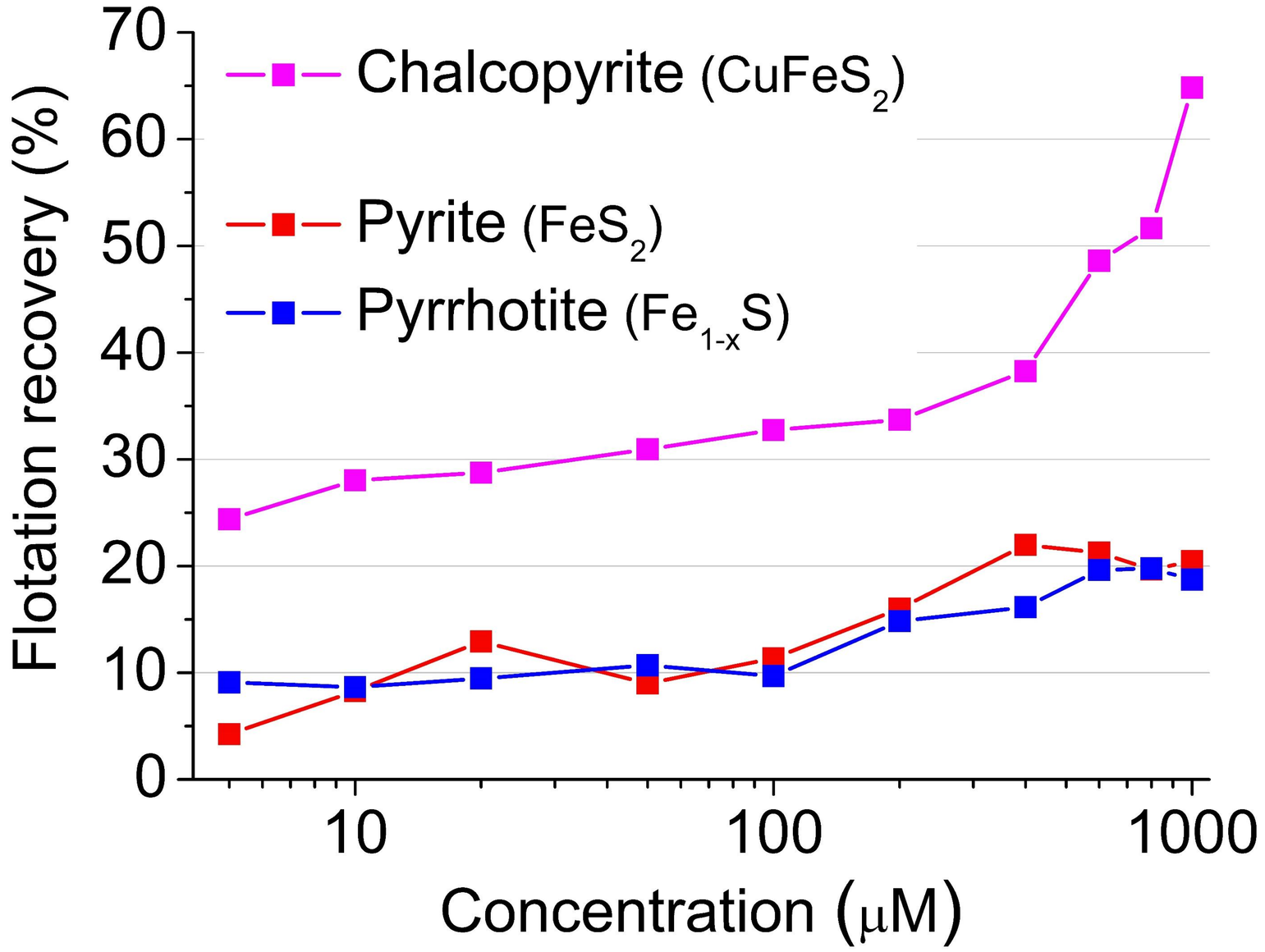
Results

Aitik mine, Gällivare (Boliden AB)



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Upcoming activities and next step

LULEÅ UNIVERSITY OF TECHNOLOGY

CLARIANT

NEW BOLIDEN

WP1 Project coordination

WP2 Scaling up on collectors

WP3 Recovery of minerals

WP4 Dissemination and Communication

3 TRL 5

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Mining innovation for a sustainable future

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