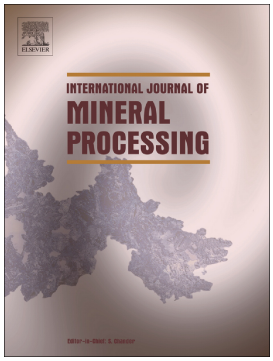


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# Comparative studies of two cationic collectors in the flotation of pyrolusite and calcite

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## ABSTRACT

The collecting ability of Dodecylamine (DDA) and Dodecyltrimethylammonium chloride (DTAC) as two cationic collectors was investigated in the flotation of pyrolusite and calcite by carrying out the flotation experiments, FTIR analysis, zeta potential tests and contact angle measurements. The single mineral flotation experiments show that the maximum differences between the floatability of pyrolusite and calcite occurring at a pH of 7.5 in the presence of DTAC is more than that of DDA. This means that DTAC acts more selectively than the DDA collector. In the microflotation experiments carried out on the artificially mixed minerals, the MnO content and recovery in the pyrolusite concentrate obtained by DDA collector is greater than that achieved by DTAC. As evidenced by ore flotation results and contact angle measurements, in the presence of both collectors, sodium carbonate acts more effective than calcium chloride as calcite depressant agents. In the ore flotation experiments, a pyrolusite concentrate containing higher MnO grade and recovery is obtained using DDA collector in comparison with DTAC. These results indicate that the collecting power of DDA is significantly more than DTAC collector. FTIR analysis and zeta potential tests show that both collectors adsorb on the surface of pyrolusite and calcite through the electrostatic interactions. Also, these analyses indicate that the adsorption of DDA on the surface of both minerals is greater and stronger than that of the DTAC collector.

Keywords: *Pyrolusite, calcite, flotation, cationic collectors, Dodecylamine, Dodecyltrimethylammonium chloride.*