

Mineral solubility, pH and redox controls on elements leaching are discussed in the section “Solubility Controls” later in this chapter.

Leachate Composition

The five rocks produced water of various compositions. Figure 8-5 is a Durov plot, a graphical display of week 1 and week 14 leachates, based on dominant cations and anions expressed in percentage milliequivalents. The plot also displays pH and dissolved solids content (estimated

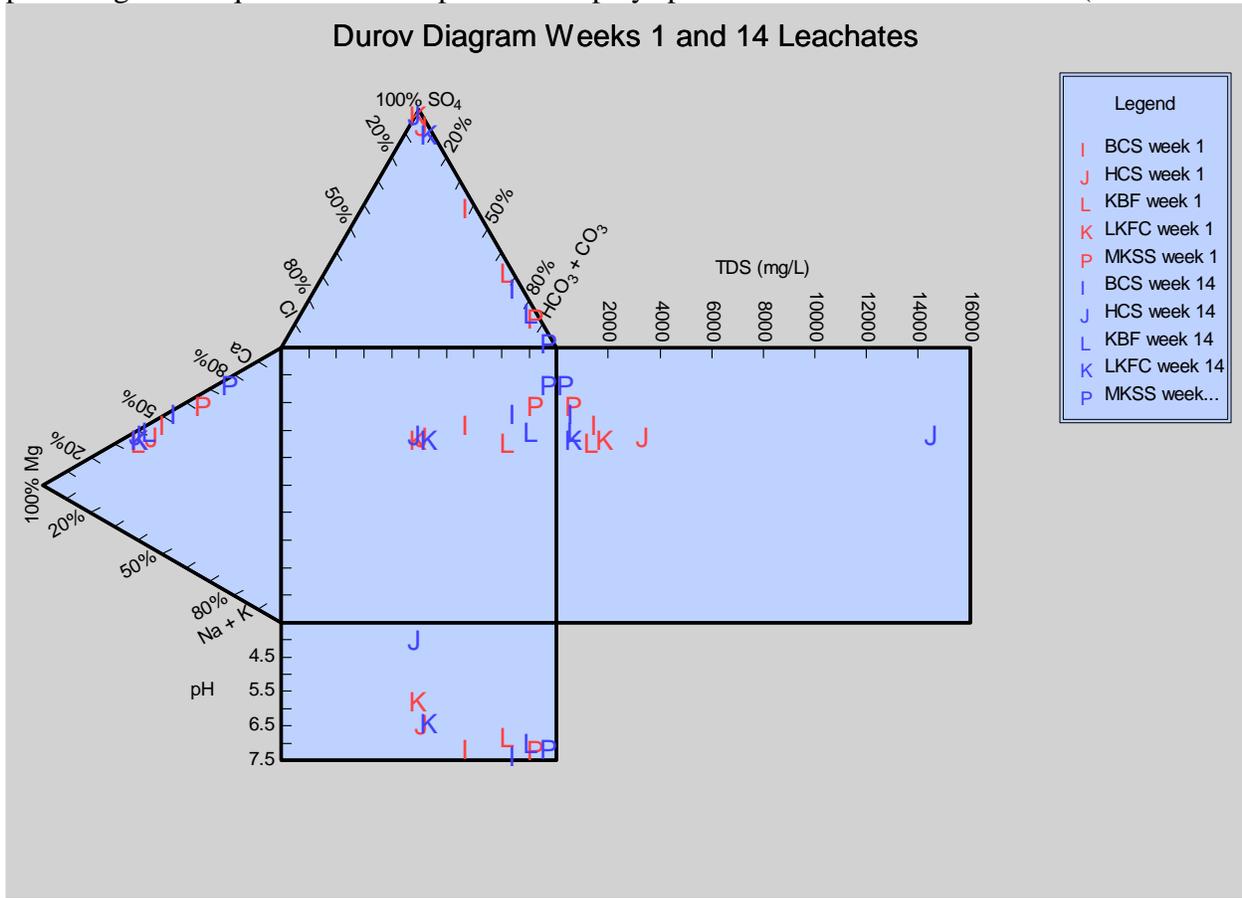


Figure 8-5. Durov (Composition) Plot of Weeks 1 and 14 Leachates. Values are medians of all labs.

from specific conductance). The cation fraction is dominated by calcium and magnesium, while sulfate and bicarbonate are the principal anions. These findings are summarized in table 8-1. The chemical signature for four of the five rocks did not change overall from week 1 to week 14; indicating weathering reactions were consistent throughout the test. Sample BCS3-PA shifted from a sulfate-bicarbonate water at week 1, to a bicarbonate-sulfate type water at week 14. This suggests a gradual depletion of pyrite weathering products, and continued alkalinity production from carbonates. Two samples, HCS-IN, and LKFC-PA produce sulfate dominated water. These two rocks have the highest sulfur contents. The other three rocks produce bicarbonate dominated leachate and have low sulfur contents. Three samples are approximately saturated for the mineral calcite. These waters have dissolved all of the calcium carbonate they can hold, and calcium and bicarbonate concentrations are at a maximum for the conditions in the column.