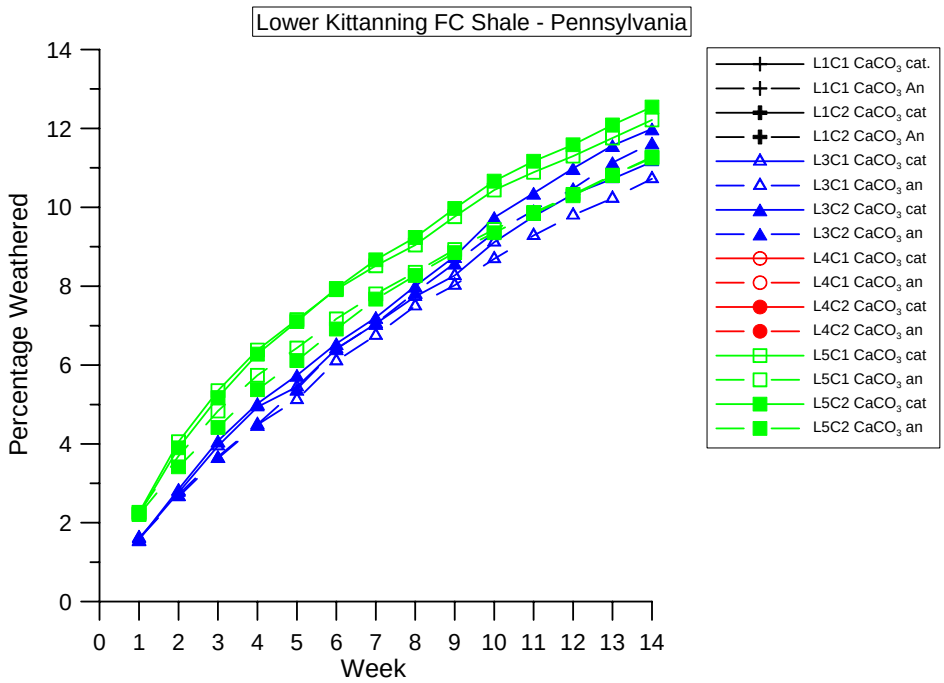

Figure 7.32. Same data as in Figure 7.30, but showing only Labs 3 and 5.

Figures 7.27 through 7.32 show that the weathering rates determined by the cation and anion approaches result in very similar values. This close relationship is also evident in Figure 7.34. The similar results of the cation and anion approaches instill confidence that the numbers from both approaches are accurate. There is generally a slightly larger percentage weathered for the cation computation. This may be due to Mg (in particular) being present in rocks other than carbonates.

Hammarstrom (Chapter 5) identified the mineralogy of the rocks used in the leaching study. Table 7.7 identifies calcium and magnesium minerals that can contribute these cations to solution. Quite a number of Mg-bearing minerals are present in these rocks. Although present, their contribution, compared to carbonate minerals, is likely minor. Figure 7.33 shows relative dissolution rates for a variety of minerals. As can be seen, most minerals are orders of magnitude less reactive than carbonates, especially under neutral pH conditions. Although chlorite is not shown on the graph, its dissolution rate is also orders of magnitude less than calcite, and in fact less than that of biotite (Freyssinet and Farah, 2000).

Table 7.8 shows the percentages of calcium, magnesium, CO_2, calcite, ankerite and chlorite. Chlorite is included because it was fairly abundant in all rock types studied and could contribute magnesium to the solutions. (Data from Hammarstrom, Chapter 5)