Dissolution of Two Australian Palygorskites in Dilute Acid

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Abstract: The dissolution of two relatively pure Australian palygorskites in mild acid was studied. For both palygorskites, Si and Mg releases were linear with respect to added acid. The rate of Si release with acid addition is equal to 0.66 μ mol Si for each μmol H^+ added in both palygorskites. The corresponding releases of Mg were 1.2 μ mol for the Al-poor and 0.47 μmol for the Al-rich minerals. Mg appears to be preferentially released into solution over Si, and both Mg and Fe appear to be preferentially released into solution over A1, suggesting a lower stability of Mg and Fe-rich palygorskites compared to A1-rich varieties. The free energy of formation of one of the palygorskites was estimated as equal to −1143.7 kcal/mol.

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