

The study on the equilibria of the system $\text{NaVO}_3 - \text{NaH}_2\text{PO}_4 - (\text{NH}_2)_2\text{CO} - \text{H}_2\text{O}$ at 298 K

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Vanadium has strong transfer ability in environment. This ability related to the solubility of vanadium in soil solution. In this article, the solubility of the metavanadate coexists with sodium, nitrogen, phosphorus has been determined. The phase equilibria of the quaternary system $\text{NaVO}_3 + \text{NaH}_2\text{PO}_4 + (\text{NH}_2)_2\text{CO} + \text{H}_2\text{O}$ were studied at 298 K using an isothermal dissoluble method.

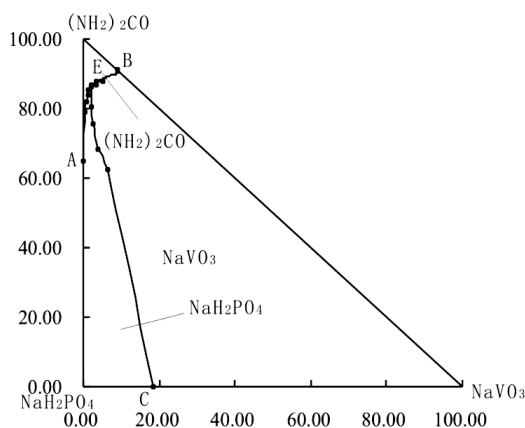


Figure 1: The solubility isotherms of the quaternary system $\text{NaVO}_3 + \text{NaH}_2\text{PO}_4 + (\text{NH}_2)_2\text{CO} + \text{H}_2\text{O}$ at 298K

The phase diagram is shown in Figure 1. There are three crystallization fields, three univariant curves, and one invariant point. No double salt was found at research temperature. The crystallizing field of urea is the smallest, which indicates urea is of a high solubility. The salting-out effect lies in the salts of NaVO_3 and NaH_2PO_4 . The aggregative species of metavanadate change with the acidity of solution. In this weakly acid system, crystallization form of metavanadate is polyoxovanadate.

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Highly siderophile elements as tracers of mantle-crust interactions in subduction zone metamorphic rocks: Evidence from the Franciscan Complex, CA

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The substantial differences in $^{187}\text{Os}/^{188}\text{Os}$ and abundances of highly siderophile elements (HSE: Re, Os, Ir, Ru, Pt, Pd) in mantle peridotites compared to subduction zone oceanic crust means that this suite of elements may prove useful in assessing mantle-slab material transport. There is currently, however, limited information regarding the mobility of the highly siderophile elements (HSE) in aqueous fluids in subduction zone environments. To explore this issue further, we measured HSE abundances and Os isotopic compositions of high-grade m-scale blocks of metabasite and related rocks from subduction-related mélangé within the Franciscan Complex, CA. Rinds of actinolite-chlorite-phengite observed in high-grade blocks have been previously interpreted to be metasomatic features that formed when fluids that serpentinized the surrounding ultramafic matrix interacted with the outer portions of the basaltic blocks.

The cores of the blocks have low abundances (<0.05 ppb) of Os, Ir and Ru, and modest concentrations (<1 ppb) of Pt and Pd. Cores are variably radiogenic, with initial $^{187}\text{Os}/^{188}\text{Os}$ ranging from 0.200 to 2.94. These are characteristics consistent with little-modified basaltic presursors. In contrast, HSE concentrations (except Re) in all of the rinds are much higher, with absolute and relative abundances approaching values typical of peridotites. Initial $^{187}\text{Os}/^{188}\text{Os}$ are also typical of upper mantle peridotites, ranging only from 0.126 to 0.132. Both HSE concentrations and isotopic ratios suggest efficient and rather uniform transference of mantle HSE to the block rinds, if the mass transfer was produced by fluids. If the result of fluid transport, these results suggest that HSE can be highly mobile in the fluids that serpentinized the ultramafic matrix and interacted with basaltic blocks. Alternatively, the rinds may have been produced by mechanical mixing of material derived from blocks with mélangé matrix in a shearing environment. Experiments are underway to allow discrimination between these possibilities.