304 - Characterization of ammonium bearing alteration associated with epithermal gold mineralization in southern Kyushu and northeastern Hokkaido, Japan

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Ammonium produces absorption of shortwave infrared (SWIR) spectrum and can be easily detected using a core scanner and a portable infrared spectrometer in the field. Furthermore, it is common in and around epithermal precious metal deposits and this provides the potential use of ammonium as a vector for deposits. However, minerals hosting ammonium and its precise concentrations are not well understood. This study addresses these questions by examining samples from two districts (southern Kyushu and northeastern Hokkaido, Japan) which host many epithermal Au mines. Southern Kyushu samples include auriferous veins and alteration halos around the low sulphidation Au deposits at Hishikari (>440t Au, 400 ppm) suggesting the substitution of potassium (ionic radius of 1.52 A) by ammonium (1.69 A). Ammonium concentrations are high with values up to 4920 ppm NH4 in samples from the Kitami area, Hokkaido, whereas samples from both Hishikari and Kasuga mines in southern Kyushu exhibit moderately high values. Samples from the Fuke and Tobaru deposits in Kyushu show high average ammonium contents (1562 ppm NH4) compared to those from the nearby Hishikari deposit (av. 565ppm NH4) whose veins occur mostly in shale. Considering the occurrence of sedimentary rocks as wall rocks and in the basement in all study areas, these sedimentary rocks likely contributed ammonium to auriferous fluids, but proximal host rocks appear to not be the major source of ammonium.