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Elizabeth J. Quinn
Indiana University - Purdue University Fort Wayne

Katie J. Sessions
Indiana University - Purdue University Fort Wayne

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Elizabeth J. Quinn, Katie J. Sessions
Sponsor: Anne Argast
Department of Geosciences
Indiana University-Purdue University Fort Wayne

Monazite is a mineral rich in rare earth elements as well as uranium and thorium. Radiogenic lead accumulates quickly in the mineral and can be analyzed with an electron microprobe (EMP) in samples of monazite older than 100 Ma (Montel *et al.*, 1996). Parrish (1990) reports that in conventional U-Pb dating analyses the non-radiogenic lead content is always very low, less than 1 ppm. Making the assumption that lead is conserved in this mineral, a revised method for geochronological dating of monazite is being investigated using energy dispersive x-ray (EDX) rather than EMP. If successful, a more generally accessible method of dating monazite would be available. Using the recently developed technique, this research attempts to determine the provenance age for sedimentary debris in the Fern Creek Formation (2.1 Ga, Chocolay Group, Marquette Range Supergroup, UP, Michigan.). The sample was collected at the Sturgeon River Dam, two miles northeast of Loretto, Michigan. It was analyzed to determine whether the Fern Creek Formation contains monazite derived from underlying Archean gneiss (~2.6 Ga) or whether the monazite originated from metamorphism associated with the Penokean orogeny (~1.9 Ga). Lead could not be found in the monazite, despite a high concentration of thorium. This monazite, therefore, could not be used for age determination by this technique. Because of the absence of lead in the monazite, huttonite ($ThSiO_4$) from the same sample was investigated. Huttonite is isostructural with monazite and contains thorium and lead from its decay (Deer, 1966). Because of this, huttonite should be similar to monazite in its ability to retain lead. The sample that was tested has a formula calculated to be: $Th_{.56}U_{.07}Ca_{.10}Al_{.09}Mg_{.04}Fe_{.06}REE_{.11}Pb_{.05}(P_{.19}Si_{.90})O_{4.0}$. The sample was analyzed using the ISI-DS 160 SEM, Kevex Sigma EDX and Quasar Quantitative Software. An 18 kV setting was used with a total count time of 1200 s. The age of the sample was computed to be 1.24 Ga using Maple 7 software to solve the complex formula presented by Montel *et al.* (1996) in his work on chemical aging of U-Th minerals. The results of this research were inconclusive. It is conceivable that lead, uranium and thorium are not evenly distributed throughout the sample. It is also conceivable that lead is not conserved. Further research, probing other sites in samples from the same geographic area, needs to be done to substantiate or refute the age that has been calculated in this study.