

Geochemistry of the U-Th-REE mineralized Tajo granite, Socorro County, New Mexico

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The Proterozoic Tajo granite consists of six outliers along two northwest-trending faults east of Socorro. The area was originally examined for uranium, but fluorite and rare earth elements (REE) were reported as well. REE consist of the 15 lanthanide elements and includes scandium and yttrium. While common in the crust, REE do not often occur in economically viable amounts, and are fundamental to a wide variety of technologies including electric cars, energy-efficient lights, and smart devices. Considering America's heavy reliance on other countries for REE supplies, identifying, analyzing, and categorizing potential REE deposits could serve as a considerable independent, economic, and strategic interest. Some Proterozoic granites, including the Tajo granite in New Mexico, contain uranium and REE, but their economic resource potential is unknown. Preliminary petrographic and geochemical analyses of the Tajo granite indicate that it is medium-to coarse-grained, peraluminas granite, but is relatively low in REE and uranium. Geochemical comparisons of the Tajo granite to other granites found in New Mexico show that Tajo has an unusual composition. It is enriched in Rb, U and Th compared to most Proterozoic granites, and depleted in CaO, Na₂O, and Sr. Future studies need to further analyze petrographic and geochemical samples to determine what depleted the REE and characterize petrogenesis.

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