

Characterization of Durango Apatite

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Batches of apatite samples, collected from four places at the Cerro de Mercado, Durango were characterized using neutron activation analysis, x-ray diffraction, scanning electron microscopy and fission track analysis.

Neutron activation analysis gave a uranium concentration (ppm) of 11.32 ± 1.12 , 7.00 ± 0.69 , 12.00 ± 1.08 and 13.00 ± 1.39 for each one of the four places. X-ray diffraction showed mainly flourapatite composition, which was also determined by x-ray analysis at the scanning electron microscope.

A mean track length of $15.3 \pm 0.9 \mu\text{m}$ was determined for confined horizontal spontaneous fission-tracks. This value is the average of more than 800 fission tracks, revealed by track-in-track technique using fission fragments from ^{252}Cf source, for creating vertical channels in apatite. Apatite annealing for one hour at 367 C and 314 C gave a track length reduction of 80% ($12.9 \pm 0.7 \mu\text{m}$) and 60% ($9.6 \pm 0.9 \mu\text{m}$) as reported by other authors.

Good quality characterized apatite crystals are available for fission track workers.

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