
The application of CR-39 autoradiographs in the textural analysis of uranium-bearing samples and thin sections

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The search for uranium mineralization is often aided by specialized instrumentation such as a scintillometer, which enables you to locate exposures of anomalous radioactivity; however, determining the actual distribution of the mineralization within geological samples is often somewhat more problematic. The use of CR-39 as a solid state nuclear track detector (SSNTD) in the textural analysis of radioactive minerals in geological samples was first described by I.R. Basham in 1981. CR-39 autoradiographs provide a detailed, high-resolution picture of the in-situ distribution of the radioactive minerals within geological samples on both the macroscopic and microscopic scales. The procedure for developing these radiographic images requires no specialized laboratory facilities and can be carried out in the field during active exploration. The resultant images provide a relatively cheap and effective means of obtaining detailed textural information that provides insight into the style of mineralization, its relationship to primary and secondary structures in the host rock, and its association with particular geological features or mineral phases. Although this technique does not provide any information as to the identity of the minerals responsible for the radioactivity, the resultant autoradiographs can be used to select regions for further detailed study such as petrography, microprobe analysis, or SEM imaging.