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Title of article Petrographic and geochemical study of the formation
of chert around the Thornton reef complex, Illinois

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ANALYTICAL METHOD

Samples from the chert layers and the surrounding dolomite were selected for analysis using the following procedure. Slabs of approximately one centimeter thickness were cut from the bulk sample perpendicular to the bedding plane. Thin sections were made from those slabs for petrographic examination and electron microprobe analysis.

Narrow strips of rock between 2 and 10 mm thick, were cut parallel to bedding from the central to the peripheral portions of each chert layer, from partial chert fringes where present, and from the dolomite associated with the chert. These strips provide a series of sections progressing from the center of the chert layer or nodule to the outside. A total of 41 dolomite, 32 partial chert, and 25 pure chert samples were pulverized with mortar and pestle. 300 milligrams of each partial chert and dolomite sample and 2 to 3 grams of each pure chert sample were then dissolved in 10 ml of 10 percent HCL and filtered to remove the insoluble residue. The insoluble residue was washed twice with distilled water, which was added to the solution. The solution was then prepared for analysis and diluted to 100 ml. The insoluble residue was oven dried and weighed. All samples were analyzed for calcium, magnesium, and strontium, using atomic absorption spectroscopy. The results are accurate to within 5 percent.

Thin sections containing chert and associated dolomite were selected for electron microprobe analysis using a Materials Analysis Company Model #MAC5-S3 electron microprobe. In areas

within the chert with measurable calcium and magnesium, the $\text{CaCO}_3/\text{MgCO}_3$ ratios and SiO_2 content were determined. No attempt was made to analyze for strontium, its concentration being too low to be determined accurately. An accelerating voltage of 20 KV and a beam current of 0.3 mA was used in the analyses. The data from the analyses after correction for background, were corrected using the "ABFAN" correction program (Boyd, 1969).

REFERENCE CITED

Boyd, F. R., 1969, Electron-probe study of diopside inclusions from kimberlite: Am. Jour. Sci, v. 267A, p. 50-69.