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Minerals in the Human Body

Erionite and offretite from the Killdeer Mountains, Dunn County, North Dakota, U.S.A.‡

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Abstract

The carcinogenic potential of erionite has sparked concern about human exposure in areas where it is present in regional bedrock. The Arikaree Formation in western North Dakota contains altered tuffaceous units with authigenic zeolites. We sampled stratigraphic profiles in the Killdeer Mountains, Dunn County, North Dakota, to determine the distribution and chemical composition of zeolites. Powder X-ray diffraction, SEM/EDS and electron microprobe analyses were carried out on sample concentrates. Only samples stratigraphically in or below the distinctive burrowed marker unit were found to contain zeolites. Erionite and offretite were the most common zeolites identified, with offretite being more abundant based on frequency of measured Mg/(Ca+Na) ratios. Intermediate chemical compositions could be natural or due to intimate intergrowths of the two minerals. A better understanding is needed of the potential toxicity across the range of erionite and offretite compositions.

Keywords: Erionite, offretite, zeolite, Killdeer Mountains, North Dakota, Arikaree