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Composition of Pyromorphites from Broken Hill, New South Wales

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ABSTRACT. Twenty eight specimens of pyromorphite from the oxidised zone of the Broken Hill orebody, New South Wales have been analysed using EPMA methods. Material was selected to represent all of the varieties of pyromorphite which have been described by earlier workers as occurring in the deposit. Aside from minor Ca^{2+} substitution for Pb^{2+} and occasionally VO_4^{3-} for PO_4^{3-}, all specimens examined proved to be either pure end-member pyromorphite or arsenian pyromorphite with a maximum arsenate content corresponding to $pyr_{2.1}mim_{0.9}$. In one specimen phosphate-arsenate zoning is evident; minor vanadate is present in the more arsenian material. Calcium-lead zoning has been detected in a pale grey-coloured specimen. These zoning patterns indicate chemical variations in aqueous solution during crystal growth. The arsenate contents appear to be directly related to the original distribution of the primary arsenides and arsenic-bearing sulfosalts. The compositions have been related to those of the solutions from which they crystallised. Apatite is a major accessory in the primary ore and this would provide the requisite phosphate ions.

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