Composition of Pyromorphites from
Broken Hill, New South Wales

ADEDAYO I. INEGBENEBOR¹, PETER A. WILLIAMS²*, RICHARD E. BEVINS², MICHAEL P. LAMBERT² & ALAN D. HART³

¹Department of Chemistry and Applied Chemistry, University of Wales College of Cardiff,
   PO Box 912, Cardiff CF1 3TB, UK

²Department of Geology, National Museum of Wales,
   Cathays Park, Cardiff CF1 3NP, UK

³Department of Mineralogy, British Museum (Natural History),
   Cromwell Road, London SW7 5BD, UK

* Author for correspondence. Current address: Department of Chemistry, University of Western Sydney,
   PO Box 10, Kingswood, NSW 2747, Australia

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 Ca²⁺ substitution for Pb²⁺ and occasionally VO⁴⁺ for
PO⁴⁺, all specimens examined proved to be either pure end-member pyromorphite or arsenian
pyromorphite with a maximum arsenate content corresponding to pyr₂₃mim₀₉. 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.

pyromorphites from Broken Hill, New South Wales. Records of the Australian Museum Supplement 15:
29–37.