

## Re-Os Dating of Sulfides Associated with Gold Mineralization in Central Victoria, Australia

D. C. ARNE,

*Western Australian School of Mines, Curtin University of Technology, PMB 22, Kalgoorlie, Western Australia 6430, Australia*

F. P. BIERLEIN,

*School of Earth Sciences, Monash University, Clayton, Victoria 3800, Australia*

J. W. MORGAN, AND H. J. STEIN

*AIRIE Program, Department of Earth Resources, Colorado State University, Fort Collins, Colorado 80523-1482*

### Abstract

We report Re-Os isotope ages that are the first for sulfides closely associated with gold mineralization at the Bendigo and Maldon goldfields in central Victoria. Two arsenopyrite samples from Bendigo contain 11 ppb Re and 0.08 ppb highly radiogenic Os (LLHR samples; Stein et al., 2000) and have model ages of  $444 \pm 7$  and  $447 \pm 7$  Ma, with a mean model age of  $446 \pm 5$  Ma. A five-point isochron based on these arsenopyrite analyses plus three pyrite analyses, including one replicate, gives an age of  $438 \pm 6$  Ma. Molybdenite associated with Au, Te, Cu, and Sb mineralization at Maldon gives an Re-Os age of  $376 \pm 2$  Ma, similar to the age of the nearby Harcourt Granite. These results support previous  $^{40}\text{Ar}/^{39}\text{Ar}$  data indicating that initial emplacement of gold mineralization in central Victoria occurred in the Late Ordovician, during the earliest stages of accretionary development of the southern Lachlan fold belt. The molybdenite data are also consistent with the mobilization and/or introduction of gold during Late Devonian magmatism.