

Preface to collected papers on monazite microprobe geochronology

The seven papers collected in this issue of *American Mineralogist* grew out of presentations made at a special session we convened at the 2002 Geological Society of America Annual Meeting in Denver. At that time, chemical dating of monazite using the electron microprobe was beginning to take off as a tool for high-resolution thermochronology in metamorphic terranes. Papers in the early and mid-1990s, for example by Suzuki and Adachi (1991a, 1991b) and by Montel et al. (1996), had pointed the way toward a viable non-isotopic dating method for accessory minerals (zircon, monazite, xenotime) and the articles by Cocherie et al. (1998) and Williams et al. (1999) emphasized the utility of monazite chemical dating in constraining the potential polygenetic and polythermal nature of monazite and the use of monazite to illuminate complex tectonic histories. In 2002, it seemed time to assess the current state of the art in both the theoretical aspects and the applications of chemical dating of monazite.

The papers in this special issue fall into two general categories. The first group deal principally with refinements in the techniques of data collection and data reduction in the difficult trace-element analyses required for geochronology. These papers include those by Jercinovic and Williams on the effects of beam damage, interferences and background acquisition, by Pyle et al. on issues relating to precision and accuracy of calculated ages, by Kuiper on the relationship of chemical ages to isotopic ages, and by Goncalves et al. on age-mapping techniques.

The second group can best be categorized as applications of the microprobe monazite dating technique to individual geologic examples. This group includes papers by Pyle et al. on thermochronology of the Chesham Pond Nappe in SW New Hampshire and its application to tectonic assembly of central New England, by Cocherie et al. on the closure of Th-U-Pb systems in monazite from partially melted rocks, and by Dahl et al. on comparative isotopic and chemical dating of Precambrian monazite from the eastern Wyoming Province, U.S.A.

We thank the authors both for their participation in the well-attended and highly successful sessions at the G.S.A. Annual Meeting in 2002 and for submitting papers for this special issue of *American Mineralogist*. We also thank Editors R.F. Dymek and Lee Groat for inviting us to put together this collection and Rachel Russell for all of her patient editorial help throughout the process. Several contributions were not completed in time for this collected group of papers, but will appear in due course in *American Mineralogist*.

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