U/Pb zircon ages constrain the architecture of the ultrahigh-pressure Qinling–Dabie Orogen, China

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Abstract

New SHRIMP and TIMS zircon ages, 40Ar/39Ar ages, and eclogite locations contribute significantly to our understanding of the ultrahigh-pressure Dabie Shan. (1) The geographic extent of the Yangtze craton that was subducted to ultrahigh pressure extends to the northern edge of the Dabie Shan. (2) The northern half of the Dabie Shan is a magmatic complex, intruded over a 10-Myr interval between 137 and 126 Ma, that accommodated ~100% N–S stretching of the pre-existing collisional architecture. (3) Granitic paragneisses and enclosing ultrahigh-pressure paragneisses have indistinguishable zircon populations. The population of Triassic zircon ages ranges from ~219 to ~245 Ma, leading us to question the prevailing assumption that 219 Ma zircons formed at ultrahigh pressure, and to propose instead that they reflect late retrogression at crustal pressures following the bulk of exhumation. © 1998 Elsevier Science B.V. All rights reserved.

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1. Introduction

The Dabie–Hong’an–Tongbai–Qinling are a 2000-km long ultrahigh-pressure (UHP) orogen formed chiefly in the Triassic by attempted N-directed subduction of the Yangtze craton or a microcontinent beneath the Sino–Korean craton (Fig. 1) [1,2]. Investigation of UHP tectonics has focused on the Dabie Shan because of the wide variety of continental crustal rocks that were metamorphosed under a complete range of low to ultrahigh pressures and temperatures. From S to N, the main rock units are a fold-and-thrust belt, blueschist, high-pressure amphibolite, quartz eclogite, coesite eclogite, the Northern Orthogneiss unit (NOU), the Luzhenguang Group, and the Foziling Group (Fig. 2). All are intruded by voluminous Cretaceous plutons, and units on the margins of the mountains are overlain by Cretaceous and younger allu-