

Crustal growth of North China as revealed by detrital zircons

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In order to characterize the crustal growth history of North China, 479 concordant detrital zircons in three sand samples from the lower reach of the Yellow River (which drains the Tibet-Qinghai Plateau, the Western Qinling Orogen, the Qilian Orogen and the North China Craton) and two sand samples from the Luan River and the Yongding River (which run entirely within the North China Craton) were measured for U-Pb age and Lu-Hf isotopic compositions. Although regional variations exist, concordant detrital zircons from the Yellow River reveal three major age groups of 2.1-2.5 Ga, 1.6-2.0 Ga, and 150-500 Ma. Detrital zircons from the smaller Luan and Yongding Rivers show three broadly similar major age groups. Although Hf isotopic compositions show both juvenile crustal growth and crustal reworking for all age groups, much of the crustal growth of North China occurred in the Neoproterozoic and Mesoproterozoic. All three rivers are characterized by a common prominent group of Hf crust formation model ages at 2.4-2.9 Ga with a peak at 2.7-2.8 Ga. The 2.7-2.8 Ga age peak observed in all the river samples agrees well with the coeval major peak for global crustal growth. However, the other suggested global peaks of crustal growth at 3.4 and 3.8 Ga are insignificant in North China. We suggest that these advocated worldwide crust formation peaks be re-examined and treated carefully.

Diamond in the Purang peridotite massif, west of the Yarlung Zangbu suture, Tibet: A new discovery

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Diamond and many unusual highly reduced minerals, such as native Fe, Cr, Ni minerals and metal alloys were reported from the Luobusa ophiolitic peridotite massif, both from chromitite and peridotite, in the east segment of the Yarlung Zangbu suture, Tibet. Coesite as pseudomorphs of stishovite from the Luobusa chromitite indicates that the chromitites were probably originated from upper mantle at depth >300 km. This paper first reports diamond and some unusual minerals from the Purang peridotite massif in the west segment of the Yarlung Zangbu suture, over 1000 km west of Lhasa.

The Purang massif is about 700km² (ca. 60x10 km) in size, mainly consists of harzburgite, lherzolite and dunite, with some gabbro and diabase dikes. Mineralogy and petrology study suggests that the Purang massif be a MOR type. Diamond and some unusual minerals such as moissanite were discovered by a traditional mineral separation technique from a 600 kg lherzolite sample, which contains about Ol 70%, Opx 20%, Cpx 10% and Cr-spinel 3%. Over 30 grains of diamond have been found, and the diamond crystals are yellowish-green in color, about 0.1-0.3 mm in size, with octahedral and cone form. These diamonds are similar to the diamonds found in the Luobusa peridotite massif, but the latter is located over 1000 km away to the east. This discovery proves that the Luobusa is not the unique diamond-bearing massif, and the new discoveries challenge the ordinary concept that the MORB type ophiolites were originated from a shallow depth in mantle.