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The Indus-Yarlung Zangbo (IYZ) ophiolites from Nanga Parbat to Namche Barwa syntaxes, Southern Tibet: First synthesis of the petrology, geochemistry and geochronology of the IYZ ophiolites, and implications for geodynamic reconstructions of Neo-Tethys

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The purpose of this first synthesis is to summarize findings on the Yarlung Zangbo Suture Zone (YZSZ) ophiolites in Southern Tibet, and to discuss some of thel remaining scientific problems. The YZSZ ophiolites have been studied for almost 30 years and constitute the youngest of the sutures recognized on the Tibet Plateau. It is now acknowledged the YZSZ is a complex assemblage of sedimentary, metamorphic and igneous rocks produced during and shortly after the collision between India and Eurasia. The ages of the various lithological units span a time interval from the Jurassic to the Middle Miocene, with some Permian and Devonian exotic blocks in the mélange zone. The YZSZ is characterized by ophiolitic complexes and an ophiolitic mélange. The ophiolites are of two types with complete and incomplete pseudostratigraphies. The complete sections, although tectonically reworked, are observed along the segment from Dazhuqu to Jiding in the Xigaze area and the Spontang ophiolite. The incomplete sequences are found in various locations, including Nidar, Kiogar, Jungbwa, Saga, Sangsang, Xigugabu, Luobusa. The incomplete nature of these ophiolites could be related to intraoceanic or orogenic/collisional origins. The YZSZ ophiolites are also distributed into two groups of ages: the Luobusa, Zedang and Kiogar sequences are Jurassic-Lower Cretaceous in age, whereas all other sequences are of a Lower Cretaceous age. Compilation of geochronological data suggest that some ophiolite sequences might have evolved for over more than 70 m.y. from their inital igneous genesis to obduction, which occurred around 70-90 Ma. Although the YZSZ ophiolites differ in terms of their petrological and geochemical characters, they were all generated in a suprasubduction zone setting, and more specifically in arc (few fore-arc) and back-arc environments. Our synthesis of $\sim$500 geochemical analyses show variable mixing of components from N-MORB-type to IAT-CAB and to OIB end-members. The Jurassic ophiolites show the maximum of arc component, whereas the Lower Cretaceous ones show little to strong mixing. In addition, most ophiolites were created in short lived (30 m.y.) basins and generated close to the continental margin of Eurasia. We propose that the Ladakh-Tibet ophiolites were generated in a suprasubduction setting similar to the Mariana arc, interarc and back-arc or to the Tonga-Lau system. The variable arc signature of these ophiolites is directly related to their initial position in the suprasubduction system.