Paleomagnetic and Geochronologic Results From Late Paleozoic and Mesozoic Rocks of the Central Tibet: Implications for the Paleogeography of the Qiangtang Terrane

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The Qiangtang terrane of Tibet is a critical region for tectonic reconstruction of Asia. Here, we summarize our paleomagnetic, rock magnetic, and geochronologic data from our study of Late Permian to Late Jurassic rocks from the Qiangtang Terrane in Central Tibet. This study consists of paleomagnetic and geochronologic sampling at 7 localities of volcanic and sedimentary rocks from eastern and southern Qiangtang. All paleomagnetic samples were subjected to detailed progressive thermal and/or alternating field demagnetization to isolate various magnetization components. Rock magnetic measurements suggest that magnetite is the dominant magnetic mineral. Resistance to alternating field demagnetization in several volcanic samples, thermal demagnetization behavior, and magnetic hysteresis data, however, indicate the presence of significant amounts of hematite as well. In nearly all cases where hematite exists, directions carried in hematite are indistinguishable from those carried in high-unblocking temperature magnetite, suggesting the hematite formed as a result of high-temperature oxy-exsolution at the time of initial cooling. Positive regional fold test and reversal test results all suggest that the stable magnetizations in these rocks are primary. Our paleomagnetic data clearly show that the Qiangtang terrane did not occupy its current position in terms of paleolatitude in both Permian and Jurassic times, and suggest significant separation between Qiangtang and surrounding Asian blocks during Late Permian through Late Jurassic. Our new data reinforce our previous interpretations on block rotations and paleogeography of the Eastern Qiangtang Terrane.