
**Data Repository**

Figure DR1. Heavy mineral concentration (HMC) plotted against ZTR index across the Sichuan, Xichang, and Chuxiong basins, showing the relative heavy mineral yields against sample maturity. HMC indices in the Sichuan Basin range from 0.5 to 5 for the Paleogene Liujia Formation and between 0.5 to 10 in the underlying Upper Cretaceous strata, and show no discernible decrease in HMC index with depth, as would be expected if dissolution was controlling the heavy mineral abundance. Thus, we can rule out significant dissolution of heavy mineral assemblages in the Sichun Basin, and similarly the Xichang and Chuxiong basins the HMC index is relative constant down section, ranging between 0.1 to 5 in both sections.

Figure DR2. Tera-Wasserbug plots showing results of rutile U-Pb analyses in the Sichuan and Chuxiong basins. Data ellipses included in intercept calculations are red, blue, yellow, and black; ellipses excluded as outliers are dashed gray, MSWD—mean square of weighted deviates. Error ellipses are 2σ.

Figure DR3. Tera-Wasserburg plots showing results of apatite U-Pb analyses in the Sichuan basin.

Figure DR4. Tera-Wasserburg plots showing results of apatite U-Pb analyses in the Xichang basin.

Figure DR5. Tera-Wasserburg plots showing results of apatite U-Pb analyses in the Chuxiong basin.

Table DR1. Sample locations.

Table DR2. Mineral counts.
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