**SUPPLEMENTARY FIGURES**

Figure S1. Geochemical signature of the analyzed samples illustrated by an A-CN-K ternary diagram ([Fedo et al., 1995](#_ENREF_24)). CN denotes the mole weight of Na2O and CaO\* (CaO\* represent the CaO associated with silicate, excluding all the carbonate). A and K indicate the content of Al2O3 and K2O respectively. Samples closer to A are rich in kaolinite, chlorite and/or gibbsite (representing by Kao, Chl and Gib). CIA values are also calculated with CIA=100\*[Al2O3/(Al2O3+Na2O+K2O+CaO\*)] ([Singh et al., 2005](#_ENREF_62))and shown on the left side, with its values are correlated with the A-CN-K. Samples from the Eastern Clinoform (Indus-5) correlate well with the canyon samples. Abbreviations: sm (smectite), pl (plagioclase), ksp (K-feldspar), il (illite), m (muscovite).

Figure S2. First-derivative curves of the DRS data calculated at 10-nm intervals for cores (A) Indus-29 and (B) Indus-30. First-derivative values are plotted at the midpoint of each 10-nm intervals (i.e., the 360 nm to 370 nm value is plotted at 365 nm). Peaks at 565 nm and 435 nm indicate the presence of hematite and goethite respectively.

Figure S3. Temporal evolution of first-derivative values for cores (A) Indus-29 and (B) Indus-30. Strong color bands at 565 nm and 435 nm for both cores suggest the presence of hematite and goethite respectively.

Table S1. Clay mineral weight percentages and calculated illite crystallinity for the cores from the Eastern Clinoform (Indus-5) and the Indus Submarine Canyon (Indus-21, - 25, -26, -27, -28, -29, -30, and -31). Ages were based on linear extrapolation of new 14C AMS ages in Table 2, and published 14C AMS age controls from Clift et al. ([2014](#_ENREF_14)) for Indus-5, -21, -26, -28, and -31, which have been recalibrated in this paper, and from Li et al. ([2018](#_ENREF_42)) for Indus-25, -27, -29, and -30.

Table S2. Major element composition of sediments from the cores from the Eastern Clinoform (Indus-5) and the Indus Submarine Canyon (Indus-21, - 25, -26, -27, -28, -29, -30, and -31).

Table S3. Diffuse reflectance spectrophotometry (DRS) data from the cores Indus-5, -21, - 25, -28, -29, and -30.

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