Globally enhanced Hg deposition and Hg isotopes in the K/Pg and PT boundaries: link to volcanism

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Mercury (Hg/TOC) spikes from eight classical PTB sections display similar patterns across the extinction interval. At Meishan, these spikes are in the LPME and ETME while at Hovea-3, Ursula Creek, Idrijca and Rizvanuša they are at the LPME and PTB. The Rizvanuša section displays one peak at the ETME; Zal and Abadeh sections, at the LPME and ETME, while Misci shows enrichment at the LPME. Three Hg/TOC spikes are seen in the Stevns Klint, Gubbio, Um Sohringkew and Poty K/Pg sections: spike I within the CF2 biozone, spike II at the K/Pg boundary layer, and spike III within the P1a subzone. In a δ^{202}Hg (MDF) vs Δ^{201}Hg (MIF) plot, most samples from the PT extinction interval lie within the volcanic-emission box. Hg-isotope signatures resulted from mixing of volcanic and normal marine sediment Hg, generating four trends whose Δ^{201}Hg show negligible variation. Rizvanuša, Idrijca and Misci sections, closer to the STLIP, show less terrigenous-Hg influx, and Δ^{201}Hg ≈ zero. Marked influence occurs in sections far distant from the STLIP (Meishan, Ursula Creek, Hovea-3) that also exhibit negative Δ^{201}Hg. The two sections from Iran, at intermediate distance from the STLIP, exhibit the highest, positive Δ^{201}Hg values (Abadeh) and the lowest, negative Δ^{201}Hg values (Zal). A Δ^{199}Hg vs Hg (n.ng^{-1}) plot suggests that volcanic Hg has been contaminated by normal marine source-Hg influx. In the K/Pg, two trends emerge from the δ^{202}Hg vs Δ^{201}Hg plot: (a) spike II trend (K/Pg clay) which displays Δ^{201}Hg ≈ zero, and (b) spike III trend in the P1a subzone. In summary, it can be said that volcanic Hg isotopes in the K/Pg boundary received little terrigenous-Hg influence. At the PTB, in contrast, volcanic Hg received influence from terrigenous-source, more intense in samples far distant from the STLIP.