

HIGH-IRIDIUM CONCENTRATION IN ALKALINE ROCKS OF DECCAN AND IMPLICATIONS TO CRETACEOUS-TERTIARY BOUNDARY ENHANCEMENT. N. Bhandari, P. N. Shukla, and A. D. Shukla, Physical Research Laboratory, Ahmedabad 380009, India.

The Deccan volcano sedimentary sequence at Anjar, Kutch contains nine basalt flows and several thick intertrappean sediment beds. The third intertrappean bed has been shown to contain three well-stratified layers having high-Ir and -Os concentrations, the highest values being 1302 pg/g and 1778 pg/g respectively. The ^{39}Ar - ^{40}Ar ages of six basalts (F2 to F8) are close to 65 Ma. The three flows below the Ir-enriched intertrappean bed (IT III) show normal magnetic polarity whereas all except one of the upper basalts show reversed magnetic polarity. The data can be taken to indicate that the sequence covers the polarity zones 31 N to 27 R. The results thus support the view that Deccan volcanism occurred on a time span longer than a million years. The paleontological evidence in this sediment bed, being the uppermost horizon containing dinosaurian fossils, the geochronological and paleomagnetic data on the lava flows sandwiching this bed and the geochemical anomalies suggest that this intertrappean bed encompasses the K/T boundary.

Chemical analysis of the nine basalt flows indicates that all, except the uppermost flow F-9, are alkaline. In their major and trace-element composition (including the REE), the alkali basalts resemble ocean island basalts (OIB). Similarities of many diagnostic trace-element ratios (e.g., Sm/Nd, Ba/Nb, Y/Nb, and Zr/Nb) with the Réunion Island basalts are consistent

with their Réunion plume origin. The uppermost basalt is tholeiitic and chemically resembles the "uncontaminated" Ambenali type of Deccan Traps. Many of these alkaline flows show high concentrations of Ir, the highest value being 178 pg/g in flow 2.

The carbonatites, associated alkaline rocks and basalts of Amba Dongar alkaline complex in Chota Udaipur also have Ir concentration ranging up to 74 pg/g. Some of these values are more than an order of magnitude higher than the concentration in tholeiitic basalts of Deccan, which typically have about 10 pg Ir/g. Many of these high-Ir rocks have formation ages close to 65 Ma, similar to the K/T boundary event and may have contributed some Ir to the boundary clay layer.

Alkaline rocks of Deccan occur in Saurashtra, in the Cambay Basin and in the Narmada-Son Belt. However, they volumetrically constitute only a minor phase and therefore, in spite of their higher concentration, their Ir contribution is too small to account for the anomalously high global inventory observed in the K/T boundary clays. Local enhancement of Ir in Deccan sediments can, however, arise if a significant part of the Ir can escape into the atmosphere, but it is not even sufficient to give rise to the Ir enhancement seen in the Anjar intertrappean sediments.