THE DISTRIBUTION OF ZIRCONIUM IN HAWAIIAN SEDIMENTS

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ABSTRACT

Hawaiian sediment samples from fifty-seven locations have been analyzed for zirconium, six after grain size separation. Chelation by EDTA was used to dissolve authigenic ferromanganese oxides and adsorbed fractions. Also, acid soluble zirconium was employed as a measure of total authigenic zirconium.

No correlation was found between zirconium concentration, on a carbonate free basis, and distance from nearest land; but zirconium concentration increased with increasing latitude. Also, the percent acid soluble zirconium decreased with increasing latitude and was not related to distance from shore. This is possibly due to dilution of subareally weathered detritus by pelagic sediments since the most heavily weathered Hawaiian Islands, Kauai and Oahu, lie in the same latitude. Analyses of zirconium in sediments in higher latitudes would be needed to verify this hypothesis. Another possible cause is the decrease of continental derived aeolian debris toward the Equator in this latitude.

A small amount of zirconium is generally chelatable from the samples studied, but is only significant in the colloidal fraction and perhaps in the coarse silt size of more pelagic sediments. Percent chelatable zirconium in the colloidal portion of the sediment increases with distance offshore and probably is related to rate of sedimentation.

The non-authigenic zirconium is probably found as a

minor constituent of clays and locally derived volcanic minerals in the sediment, and some also is probably contributed by continental aeolian debris, possibly including zircon.