

OCEAN FLOOR SECONDARY MINERALS IN VOLCANOCLASTITES; AN ATTEMPT OF THERMODYNAMIC ANALYSIS.

ALBERT ISKHAKOV

Ocean floor secondary minerals in volcanoclastites (Marshall Islands, Pacific): an attempt of thermodynamic analysis.

ALBERT ISKHAKOV P.P. Shirshov Institute Of Oceanology Moscow, Russia Secondary minerals in redeposited subalkaline picrite-basalt breccia drilled during ODP, leg 143, are represented by smectites, analcyme, apophyllite and various zeolites with relicts of initial volcanic glass. Mass-balans calculation showed different mechanism of alteration for large and small fragments of initial material. Large fragments were altered by diffusive processes, with potassium-enriched smectite formation, while small fragments were transformed into Na-Ca zeolites by infiltration of the sea-water. The boarders of the large fragments show significant enrichment in sodium content, preventing from sodium penetration inside the fragment during the alteration. Thermodynamic analysis (by Korzhinsky), based on the real mineral composition, revealed stability fields for main secondary mineral associations in coordinates PH-T. PH of the reactions ranges within 4-9 and T ranges within 300-420K, indicating a hydrothermal nature of the alteration. Observed in thinsections the substitutions of erionite by shabazite and back allow to presume the temperature had been ranging around the equilibrium point for that reaction (360-370K) for a long time.

The hystory of the sequence development was reconstructed at the basis of performed study. Initially rapid cooling of the sequence became slower after it had been covered by overlying sediment. Then hydrothermal circulation arose within the volcanoclastic body, resulting in alteration processes and secondary mineral formation.